

UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF CALIFORNIA

Before The Honorable James Donato, Judge

ERICA FRASCO, et al.,	)	
individually and on behalf of	)	
all others similarly situated,	)	
	)	
Plaintiffs,	)	
	)	
VS.	)	NO. 3:21-CV-00757 JD
	)	
FLO HEALTH, INC., META	)	
PLATFORMS, INC.,	)	
	)	
Defendants.	)	
_____	)	

San Francisco, California  
Thursday, July 24, 2025

**TRANSCRIPT OF PROCEEDINGS**

**APPEARANCES:**

For Plaintiffs:

LOWEY DANNENBERG, P.C.  
44 South Broadway, Suite 1100  
White Plains, New York 10601

**BY: CHRISTIAN LEVIS, ATTORNEY AT LAW**

SPECTOR ROSEMAN & KODROFF, P.C.  
Two Commerce Square  
2001 Market Street, Suite 3420  
Philadelphia, Pennsylvania 19103

**BY: DIANA J. ZINSER, ATTORNEY AT LAW**

**(APPEARANCES CONTINUED ON FOLLOWING PAGE)**

Reported by: Ruth Levine Ekhaus, RDR, RMR, FCRR, CCG  
CSR No. 12219, Official United States Reporter

**APPEARANCES:** (CONTINUED)

For Plaintiff:

LABATON KELLER SUCHAROW LLP  
140 Broadway  
New York, New York 10005

BY: **CAROL C. VILLEGAS, ATTORNEY AT LAW**  
**MICHAEL P. CANTY, ATTORNEY AT LAW**  
**GLORIA J. MEDINA, ATTORNEY AT LAW**

For Defendant Flo Health, Inc.:

DECHERT LLP  
US Bank Tower  
633 West 5th Street, Suite 4900  
Los Angeles, California 90071-2032  
BY: **BENJAMIN M. SADUN, ATTORNEY AT LAW**  
**ALLISON OZUROVICH, ATTORNEY AT LAW**

DECHERT LLP  
Cira Centre  
2929 Arch Street  
Philadelphia, Pennsylvania 19104-2808  
BY: **THEODORE E. YALE, ATTORNEY AT LAW**  
**CLARE P. POZOS, ATTORNEY AT LAW**

DECHERT, LLP  
One International Place  
100 Oliver Street  
Boston, Massachusetts 02210  
BY: **BRENDA R. SHARTON, ATTORNEY AT LAW**

For Defendant Meta Platforms, Inc.:

LATHAM & WATKINS  
555 Eleventh Street, NW, Suite 1000  
Washington, D.C. 20004

BY: **ANDREW B. CLUBOK, ATTORNEY AT LAW**

LATHAM & WATKINS LLP  
650 Town Center Drive, 20th Floor  
Costa Mesa, California 92626

BY: **MICHELE D. JOHNSON, ATTORNEY AT LAW**

LATHAM & WATKINS LLP  
505 Montgomery Street, Suite 2000  
San Francisco, California 94111

BY: **MELANIE M. BLUNSCHI, ATTORNEY AT LAW**

(APPEARANCES CONTINUED ON FOLLOWING PAGE)

**APPEARANCES:** (CONTINUED)

GIBSON, DUNN & CRUTCHER LLP  
One Embarcadero Center, Suite 2600  
San Francisco, California 94111-3715

BY: **ELIZABETH K. McCLOSKEY, ATTORNEY AT LAW**  
**ABIGAIL A. BARRERA, ATTORNEY AT LAW**

**Also Present: Anjali Dahiya**

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## PROCEEDINGS

Thursday - July 24, 2025

9:08 a.m.

P R O C E E D I N G S

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**THE COURTROOM DEPUTY:** All rise.

(Proceedings were heard out of the presence of the jury.)

**THE COURTROOM DEPUTY:** This court is now is session.

The Honorable James Donato presiding.

**THE COURT:** Good morning.

**ALL:** Good morning, Your Honor.

(Pause in proceedings.)

**THE COURTROOM DEPUTY:** Please be seated. Calling  
Civil 21-757, Frasco versus Flo Health, Inc.

**THE COURT:** Now, what's the schedule for today in  
terms of witnesses?

**MR. SADUN:** Your Honor, the first witness will be  
Mr. Karkanias, who we left off with yesterday.

**THE COURT:** Yes. And then after that?

**MR. CLUBOK:** Your Honor, after that we're going to  
call Dr. Zervas, right after. And --

**THE COURT:** Oh, okay.

**MR. CLUBOK:** -- partly because he's got a family  
issue, so he has to be done today to go back to Greece. So  
that means we're going to have to call him out of order a bit,  
because he responds both to Dr. Egelman and to Dr. Golbeck.

**THE COURT:** Yes, we talked about that.

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1           **MR. CLUBOK:** Is it okay if I just mention that to the  
2 jury or could you explain to the jury? Whatever you prefer --

3           **THE COURT:** There's no -- I don't think there's any  
4 reason to flag it.

5           **MR. CLUBOK:** The only reason, Your Honor, if I may, is  
6 the opinion is specifically Dr. Golbeck mischaracterizes things  
7 or Dr. Golbeck is wrong, something like that. They won't even  
8 know what he's talking about.

9           **THE COURT:** All he has to say is: No, you're going to  
10 be hearing later from -- what is it Dr. Golbeck?

11           **MR. SADUN:** Yes, Your Honor.

12           **THE COURT:** Here's my view on Dr. Golbeck.  
13 You okay with that?

14           **MR. CANTY:** Yes, Your Honor. There was no bias. And  
15 then we intend to call Mr. Satterfield from Meta.

16           **THE COURT:** What about the London person?

17           **MR. CANTY:** I don't know their availability. I  
18 haven't been -- we're ready to cross her whenever they --

19           **THE COURT:** You have her on standby.

20           **MR. CLUBOK:** Yeah, they do. There's another --

21           **THE COURT:** I think it's Flo's witness, isn't it? Is  
22 it your witness, Flo?

23           **MS. SHARTON:** It is.

24           **OTHER ATTY:** Why don't you guide the discussion?

25           **MS. SHARTON:** Brenda Sharton. Yeah, she's ready and

## PROCEEDINGS

1 on standby.

2 **THE COURT:** All right. Why don't we --

3 **MS. SHARTON:** I think the plaintiffs were still  
4 putting on witnesses, and so -- and we're happy to have  
5 Mr. Satterfield out of turn and Mr. Zervas out of turn.

6 She's ready to go whenever, but -- not out of turn, but --

7 **THE COURT:** Well, why would you object to have that  
8 done, Plaintiffs?

9 **MR. CANTY:** It's not our witness, Your Honor, so my  
10 understanding is that Flo wanted to call this witness on their  
11 case-in-chief. So we're available to take her  
12 cross-examination whenever she's available, but we'd like to  
13 finish our case first.

14 **THE COURT:** All right. You want to do that today and  
15 then we'll reserve this person for later?

16 **MS. SHARTON:** Sure.

17 **MR. CANTY:** Yes.

18 **THE COURT:** Good? Oh, okay. We'll do that.

19 Let's bring up the witness, please, and we'll bring out  
20 the jury.

21 (Pause in proceedings.)

22 **THE COURTROOM DEPUTY:** All rise.

23 (The jury enters the courtroom.)

24 (Proceedings were heard in the presence of the jury.)

25 **THE COURTROOM DEPUTY:** Please be seated. We are back

**KARKANIAS - DIRECT / SADUN**

1 on the record in Civil 21-757, Frasco versus Flo Health, Inc.

2 **THE COURT:** All right. You may continue.

3 **CHRIS KARKANIAS,**

4 called as a witness for the Defendants, having been previously  
5 duly sworn, testified further as follows:

6 **DIRECT EXAMINATION**

7 **MR. SADUN:** Good morning, Mr. Karkanias.

8 **THE DEFENDANT:** Good morning.

9 **MR. SADUN:** Your Honor, at this time, we'd like to  
10 qualify Mr. Karkanias as a rebuttal expert to Serge Egelman in  
11 the areas of mobile app development and software development  
12 kits.

13 **THE COURT:** Okay. Any objection?

14 **MR. LEVIS:** No, Your Honor.

15 **THE COURT:** All right. The witness is qualified on  
16 that topic.

17 **BY MR. SADUN:**

18 **Q.** Mr. Karkanias, the jury heard from Serge Egelman. Were  
19 you in the courtroom during his testimony?

20 **A.** Yes, I was.

21 **Q.** Have you had the opportunity to review the reports he  
22 submitted in this case?

23 **A.** Yes, I have.

24 **Q.** Have you reviewed his logs?

25 **A.** Yes.

1 Q. Have you reviewed his deposition transcripts?

2 A. Yes.

3 Q. Having reviewed all that information, do you agree with  
4 his opinion that Flo shared personally identifiable information  
5 with Facebook Analytics?

6 A. I do not.

7 Q. Why not?

8 A. He fundamentally misunderstands the data that was  
9 transmitted and that the data itself was encrypted and  
10 deidentified and further, as I'll explain later, was unreliable  
11 and indecipherable.

12 Q. I'd like the jury to better understand how you arrived at  
13 your opinions. What did you review?

14 A. Sure. I think this next slide shows the various materials  
15 reviewed. It included the source code for all the versions of  
16 the app during the class period; data transmitted between the  
17 Flo app and the SDK, the Facebook Analytics SDK, most  
18 importantly; thousands of pages of internal documents from Flo  
19 and Facebook; the sworn testimony and discovery responses from  
20 Flo and Facebook; scientific literature; the binaries  
21 themselves from Flo for both platforms, iOS and Android; and,  
22 of course, Serge Egelman's reports themselves.

23 Q. What do you mean by data transmitted between the Flo app  
24 and Facebook Analytics?

25 A. So when the app is installed or first used or used at all,

1 it transmits data, and I set up an environment to examine that  
2 data. Here you'll see that laboratory environment included the  
3 actual hardware targeted for the app, so there's a Galaxy S5  
4 and iPhone 6 and iPhone SE. These were the devices present  
5 during the class period, and used software to intercept the  
6 message traffic, as it's called, as the app was operated on the  
7 device.

8 The type of software are called usually "man in the middle  
9 tools." One of the tools we used was something called  
10 mitmproxy, for "man in the middle proxy." Charles Proxy is  
11 another one.

12 I also used tools to load the app onto the iPhone. It's a  
13 cleverly named tool called Sideloadly to allow you to put an  
14 app on the iPhone without using the App Store, since these apps  
15 are no longer available on the App Store because they're in the  
16 past.

17 The Android device allows you to load what are called  
18 APKs, the binaries, directly on the device, and so no tool is  
19 needed for that.

20 **Q.** Having connected the physical devices to your computer,  
21 what did you observe being transmitted?

22 **A.** So I'll refer to this as "message traffic" generally and  
23 throughout these slides. And it's an encrypted stream of data  
24 that requires these special tools to even see it and also to  
25 decrypt it.

1 I think probably folks are familiar with the S -- the  
2 HTTPS as the safe designation when you're browsing websites,  
3 because that means the traffic between your browser and  
4 whatever you're looking at is encrypted. This is quite similar  
5 to that.

6 Q. Why did you conduct your testing using this methodology?

7 A. Well, so we've all heard about the source code review and  
8 looking at lines of code and so on, and that's -- that's a  
9 useful first step, but in the end, those are just instructions  
10 of how the app is intended to perform.

11 The only way to really know how an app will perform on the  
12 device is to actually run it on the device and see what  
13 happens, and this testing methodology is a standard in software  
14 engineering to determine all the operating characteristics of  
15 your application on a particular device.

16 Q. And to use your words, did you actually run it on devices?

17 A. I did.

18 Q. Let's turn to SDKs briefly. Do you agree with Flo's  
19 choice to use SDKs?

20 A. Yes, absolutely. The -- it's the best way to develop an  
21 app and to ensure that the app behaves the way you want it to  
22 or expect it to from a stability perspective. These libraries  
23 of code, as the jury has heard earlier, are battle-tested  
24 libraries of code that are reused by developers all over the  
25 world to develop their apps.

1 Q. How would you expect a modern application to perform if it  
2 did not use SDKs?

3 A. Well, because of what I just said, the opposite would be  
4 true. If you didn't use an SDK, it would be unreliable at  
5 best. You would not be guaranteed its performance, and you  
6 would not be able to rely on the fact that it would operate as  
7 you intended.

8 Q. Looking at the slide, can you tell the jury some common  
9 SDKs used in everyday mobile applications?

10 A. Sure. So you'll see six categories here. You may not  
11 realize it, as end users of these applications, but pretty much  
12 everything you do on an app somewhere uses an SDK of some kind.

13 If you're making an in-app purchase or navigating --  
14 whoever's used GPS before, you're using a navigation SDK or  
15 framework. If you received a text message, it's a push  
16 notification, usually. If you ever logged in anywhere, you're  
17 using an SDK to authenticate.

18 The analytics SDK, there are several. The Facebook  
19 Analytics SDK is at the heart of the discussion today, but  
20 the -- those are commonly used by developers to understand how  
21 their app is performing.

22 Because remember, as I said earlier, you can't really know  
23 how the source code is going to perform unless you watch it run  
24 on a device, and these analytics SDKs allow you to do that and  
25 determine if it's working as you intended it to.

1 Q. Do most apps use at least one of these six categories of  
2 SDKs?

3 A. Yes, most definitely. In fact, to even publish an app on  
4 the Apple App Store, you need to have at least one SDK called  
5 the native SDK, which provides all the platform smarts to  
6 access the iPhone.

7 Quite a few apps use, you know, 10, 15 SDKs in their  
8 development.

9 Q. Let's talk about the Facebook Analytics SDK specifically.

10 Was the Facebook Analytics SDK helpful to Flo?

11 A. Yes, again, for the same point I made earlier of the fact  
12 that you really can't know how an app is going to operate until  
13 it's operating. You can guess based on the source code, but  
14 nothing beats the real world.

15 So it allows app developers to understand how their app is  
16 being used on a particular device. I wish I could say that  
17 software -- all software that's written is bug-free, but I've  
18 yet to encounter any bug-free code in my 40 years of developing  
19 code.

20 So it helps you identify the bugs inadvertently that  
21 you've left in the code or any performance bottlenecks that you  
22 haven't thought about within the app and to repair them. And  
23 that's the last category there: Find ways in which to make the  
24 app even better.

25 Q. Can you give an example of how this worked in practice?

1   **A.**    Sure.  Let's say there's a feature that your initial  
2   design indicates users like, but it turns out no one is using  
3   it, so maybe it's buried somewhere.  Maybe only 10 percent of  
4   the population you thought would use it uses it.  So you -- you  
5   know that because your dashboard tells you no one is accessing  
6   this part of your app, so you move it.  You make a design  
7   change or move the buttons up or make it one click instead of  
8   three clicks or something like that, and then measure again  
9   whether that improves the user experience.

10         Another might be to find a bug.  Let's say your app has  
11   lots of messaging components where users can communicate with  
12   one another, and millions of those users are communicating on  
13   one day but suddenly they stop communicating.  That would  
14   indicate a bug.  Something broke.

15         And you might think it would be very obvious to find that  
16   without these analytics, but it's not that obvious.  Sometimes  
17   the -- it shows up in the support logs.  The users start  
18   calling in, but the best thing to do is be proactive about it  
19   and have your app instrumented, as they call it, with these  
20   analytics SDK so you can detect the problem before it becomes a  
21   big problem and then repair it.

22   **Q.**    In your experience, could Flo have responsibly developed  
23   its app without use an analytics SDK?

24   **A.**    No.  It would be irresponsible to -- to -- to try -- to  
25   attempt to do that, again, because -- I don't wish to be

1 repetitive here, but you don't really know how an app is going  
2 to operate until it's operating. If you don't have a means to  
3 know how it's operating, you're flying blind.

4 **Q.** Your slide says developers use analytics SDKs to improve  
5 their apps.

6 What information did Flo receive back from Facebook  
7 Analytics that may have helped it improve the app?

8 **A.** Right. So the way this works is you -- you instrument the  
9 app so that it -- when a -- a certain part of it is activated,  
10 a button is pressed or what have you, data is sent in a  
11 deidentified way to the place that aggregates at the analytics  
12 function. And that -- "aggregates" is just a fancy way of  
13 saying you start doing statistics on it and gathering  
14 results -- how many people press the button, how long did it  
15 take them to find the button, things like that.

16 And that accumulates in a dashboard somewhere, and that --  
17 usually the vendor or the developer group will log in to that  
18 portal, like a website, and see on the dashboard the traffic.  
19 So many people have used this part of the functions, others  
20 another part.

21 And you can even see trends over time and show, well,  
22 suddenly the message traffic has disappeared, and developers  
23 will start to inquire why and look into their app and from  
24 there, decide whether or not their button is buried somewhere  
25 or whether there's an actual bug that they need to fix.

1 Q. Let's drill down into the detail of these dashboard  
2 summaries.

3 A. Sure.

4 Q. What did they contain?

5 A. So aggregate data. There was in the case -- in this case  
6 here, it would be -- there wouldn't be individual users. There  
7 wouldn't be individual devices. Although the data is flowed  
8 into these dashboards one device at a time, you don't know  
9 which user was using that device, and you accumulate those  
10 devices over time so that you see an aggregate of, you know,  
11 X number of iPhones were active this day, but not which ones  
12 exactly.

13 Q. I want to be clear. Could there have been any personal  
14 information on these dashboards?

15 A. No. That would be impossible.

16 Q. During his testimony, Dr. Egelman testified that Flo sent  
17 data to Facebook Analytics that was tied to users.

18 Do you agree with that?

19 A. No.

20 Q. Why not?

21 A. Because they didn't send any personally identifiable  
22 information. They used a device identifier to shield the user  
23 from that information?

24 You've heard about device IDs, and they're these  
25 random-looking characters here that uniquely identify the

1 device, but that's all they uniquely identify, and they're used  
2 so that the developers can track what is happening with the app  
3 that you've purchased or installed but not what the user is  
4 doing, just what the app is doing.

5 **Q.** Can you explain more how device IDs are generated?

6 **A.** It's -- well, in technical terms, it's a cryptographic  
7 hash. Basically that's a fancy way of saying it's a -- it's a  
8 hash that can -- it's a numerical -- alphanumeric string that  
9 is uniquely associated to the device?

10 And I can expand further about how that works. It sounds  
11 magical, but it's just math.

12 And you can generate them over and over again, and it will  
13 still be unique to that device. And it's a bit like, I guess,  
14 by analogy, you get a new cell phone and it has -- it can have  
15 any phone number on it, but you can associate the phone number  
16 with that cell phone, and you can change it as well.

17 That phone number doesn't necessarily identify you; it is  
18 connected to that device.

19 **Q.** From an app development perspective, what is the  
20 significance that everything Flo sent through the Facebook  
21 Analytics SDK was associated with a device rather than a  
22 person?

23 **A.** Well, device identifiers are privacy-preserving  
24 mechanisms. They -- because they only relate to the device and  
25 intrinsically themselves -- have nothing to do with the person,

1 they protect your privacy. And so it allows the developer to  
2 or -- and the company providing the software to provide a  
3 stable, reliable, known quantity to you to use without  
4 revealing any personal information and without having to fly  
5 blind.

6 Q. You mentioned this in passing, I think, two questions ago,  
7 but I'm hoping you can provide a bit more detail.

8 How can users reset their device IDs?

9 A. Sure. It's a few clicks or button-presses in settings to  
10 reset the -- during the class period, it was called  
11 "resetting." Now it's even less clicks to do that.

12 And that's another example of the continuous improvement  
13 that goes on is that they want you to be able to reset these  
14 things if you so desire, so it's -- it's been easier and easier  
15 over time to do that.

16 And you just click "reset" and it will reset and generate  
17 a new ID, and now nothing previously is connected to you  
18 anymore.

19 That's fine for the -- for the developer because they,  
20 again, don't care which device it is exactly; they just want to  
21 know a device had this event happen or not happen.

22 Q. During the class period, how long would it take to reset  
23 your device ID?

24 A. 15 seconds.

25 Q. Does the fact that people can potentially defeat the

1 device ID make it any less valuable as tool for protecting  
2 privacy?

3 **A.** Not at all. I mean, intrinsically, the device ID is  
4 deidentified. It doesn't -- it's not derived from your  
5 personal data.

6 It protects your privacy, as I explained before.

7 It can be defeated. You know, any security mechanism can  
8 be defeated, but if you have a safe in your house where you put  
9 your valuables in, it's still a safe even if someone can break  
10 into it; or if you lock your door and someone picks that lock,  
11 it still was a lock.

12 So this is the mechanism to provide you that privacy and  
13 security, even though we can contemplate ways in which it can  
14 be defeated.

15 **Q.** Sticking with your analogy, based on your review of the  
16 code, did Flo secure its safe as best it could?

17 **A.** Yes.

18 **Q.** Let's talk about the Flo app event data with device IDs  
19 sent to Facebook Analytics.

20 Does this list accurately represent the 12 custom app  
21 events at issue in this case?

22 **A.** Yes, it does.

23 **Q.** Can you tell the jury how a device triggers one of these  
24 12 events?

25 **A.** Sure. So when you first install the app -- you've

1 downloaded it, installed it -- these first launch event names  
2 are, as it sounds, launched at -- the first time, and they're  
3 launched one -- once and only once when the app is first  
4 initialized or first -- run for the first time.

5 Q. What are we looking at here? And to orient you, this is  
6 from your expert report.

7 A. Yes, so -- thanks.

8 So you'll remember earlier I said we set up a lab  
9 environment with physical hardware that we use tools to  
10 intercept what the app was saying over time, the message  
11 traffic.

12 Here, I've highlighted -- you'll see  
13 R\_SELECT\_LAST\_PERIOD\_DATE, and you can see that the payload  
14 that that event name carries with it is "value known."

15 So what actually happens on the app side, on the device,  
16 is someone started the app. We don't know from this message  
17 traffic who that was. Someone did it.

18 And the app -- there was no way to get past it without  
19 answering the question, and all we know about what they said is  
20 that they answered something, so the value is known; but  
21 nowhere here does it -- in this message traffic does it say  
22 what that answer was.

23 Q. Under any circumstances, does it reveal the date of a  
24 user's last period?

25 A. Not in this message traffic, no. You can't -- you can't

1 determine it from here.

2 Q. What does this screen tell you about the user?

3 A. Nothing.

4 Q. There's been a lot of discussion in this case concerning a  
5 key. That term came up a number of times yesterday.

6 A. Yeah.

7 Q. Would a key tell you anything more about this user?

8 A. No. At most it would tell you what the intended utility  
9 is of this event name.

10 Q. What do you know, even with a key, about this user?

11 A. Nothing.

12 Q. Do you know if it's a man or woman?

13 A. No.

14 Q. Do you know if it's someone who actually has periods?

15 A. No. I'll actually even say, not to be overly -- not to  
16 over-make this point, but it's important to realize I don't  
17 even know if this is an automated process. Right? This could  
18 be in a lab where you have a machine pressing the button to  
19 exercise the app. So it might not even be a human being  
20 running the app.

21 Q. Now, to be fair, not all of the information that Flo  
22 triggered and sent had "value known" or value "unknown";  
23 correct?

24 A. That's correct. In some cases, you would -- the payload,  
25 the value that was contained in the event, would have words,

1 "get pregnant" or things to that effect.

2 Q. How does that factor into your analysis?

3 A. Same thing. I mean, it's -- we can imbue -- I call this  
4 the illusion of accuracy. We kind of think we know what it  
5 means when we see the words "get pregnant," but without the  
6 benefit of Flo's internal documentation or all the things that  
7 have been produced in litigation or the key that we've talked  
8 about, you don't really know what it means. It might -- it  
9 might mean somebody looking at a tutorial about pregnancy  
10 or -- and that's the goal they have to set.

11 It might mean that -- remember these are first-launch  
12 questions that you can't evade when you install the app. It  
13 might be somebody just answered whatever randomly just to get  
14 past that screen to see what's next, or they're thinking about  
15 installing this app and keeping it, so they just want to get  
16 through and see how it works.

17 So it doesn't really tell you anything.

18 Q. From a technology perspective, is there anything that  
19 Facebook could do to decipher this data?

20 MR. LEVIS: Objection. Speculation.

21 MR. SADUN: Your Honor --

22 THE COURT: It's opinion testimony. It's just -- it's  
23 an opinion. Go ahead.

24 THE WITNESS: Can I conceive of a way that Facebook  
25 could circumvent this?

1 BY MR. SADUN:

2 Q. I'll restate.

3 Serge Egelman suggested yesterday that Facebook maybe  
4 reverse-engineered the Flo app.

5 A. Mm-hmm.

6 Q. Do you agree with that assessment?

7 A. Well, I remember him saying that. I would find it -- so  
8 I'll just remind everyone -- so I spent 10 years at Microsoft,  
9 gigantic -- one of the most successful software engineering  
10 companies on the planet. It -- it would be unheard of for a  
11 company like that to reverse-engineer an app just to figure out  
12 how it worked.

13 In fact, you know, I ran a division, a group of people,  
14 and if anyone had done that that worked for me, I would fire  
15 them on the spot for violating the terms of services or any of  
16 a number -- a myriad of things that would be problematic for  
17 that exercise.

18 So although you can contemplate doing something like that,  
19 no one in their right mind at a large company would do that as  
20 a -- as a business practice, to be frank.

21 It's a bit like saying, well, I could hire a safecracker  
22 to break into your house and break into your safe, and you  
23 could imagine that, but that's not realistic.

24 Q. Let's look at another example. What are we looking at  
25 here?

1   **A.**    So here's another event.  This is R\_PREGNANCY\_WEEK\_CHOSEN.  
2    This is on the Android platform.

3           And you can see that I've highlighted two areas, one that  
4   ends in 10 and one that ends in 7.  I won't read out the whole  
5   message traffic because it's not that useful.  But I'll explain  
6   what I did here, in the lab, is in the "pregnancy week"  
7   dialogue chose a number, and this is the message traffic that  
8   resulted.

9           Now, as you look at it, you can't tell what number I  
10   chose.  Did I choose 10 or did I choose 7?  And that's really  
11   important, because, again, this illusion of accuracy -- the  
12   answer is I chose 10, but it says "chosen week 7."

13          So either that's a bug and it's reporting the wrong number  
14   or we don't really understand what the message traffic is  
15   supposed to be.

16          I can guess that -- I can look for that 10 because I know  
17   I put a 10 in.  But if someone else was seeing this message  
18   traffic, they wouldn't know that and wouldn't be able to make  
19   any sense of this in the -- in the way that we've been implying  
20   earlier -- yesterday.

21   **Q.**    Putting aside the fact that it responded with a number  
22   different than what you entered yourself, do you agree with  
23   Dr. Egelman that this conveys the number of weeks that a user  
24   is pregnant?

25   **A.**    No.  Again, I -- you know, I don't wish to be repetitive

1 here, but it's important to sort of recognize there is this  
2 illusion of accuracy that's imposed on the knowledge that we  
3 have based on the litigation documents.

4 You know, they say hindsight is 20/20, and that's because  
5 once you know what happened, you can look back and realize what  
6 happened. But if you don't know, you know, this could be the  
7 week I have chosen that I would like to become pregnant or the  
8 week I think I want to give birth or I want to know if I was  
9 pregnant on this week, what would happen or any of a number of  
10 things that are quite rational that we can exclude, because we  
11 know how the app is supposed to operate because of internal  
12 documents. But no one else would know.

13 Q. As a demonstrative, I am pulling up for the jury a chart  
14 of the 12 custom app events.

15 MR. SADUN: Your Honor, this was shown to plaintiffs  
16 in advance and they had no objection.

17 THE COURT: Okay.

18 BY MR. SADUN:

19 Q. From where you're standing, can you see it?

20 A. I cannot.

21 Q. Well, that's a problem. Where can I put it to make it  
22 easy for you?

23 A. I can see most of it, but --

24 Q. This way?

25 A. Hold on. Can I use this paper here or --

1 Q. Yes. Plaintiffs agreed --

2 (Reporter interruption for clarity of the record.)

3 BY MR. SADUN:

4 Q. In front of you is a piece of paper identical to this one.  
5 Plaintiffs agreed that you could have that with you there.

6 A. So if I can use both, I'm fine. I can see both. Thank  
7 you for the consideration.

8 Q. Starting with R\_CHOOSE --

9 THE COURTROOM DEPUTY: Wait. Get the microphone over  
10 there, the wireless mic. Over there there's a wireless mic, if  
11 you get it.

12 BY MR. SADUN:

13 Q. Starting with R\_CHOOSE\_GOAL --

14 A. Yes.

15 Q. -- were any names shared with this app event when it  
16 triggered?

17 A. No.

18 Q. How about birth dates? When this event would fire, would  
19 any birth dates of any users ever be transmitted?

20 A. No.

21 Q. And e-mails? Would those be transmitted?

22 A. No. In fact, I can generalize. No PII was transmitted by  
23 any of these events.

24 Q. Did you say no PII was transmitted with R\_CHOOSE\_GOAL?

25 A. Right.

1 Q. I will add that, then.

2 A. Yeah. Sorry. I looked -- I read ahead -- so with any of  
3 these events.

4 So PII, personally identifiable information, like a name  
5 or a birth date or an e-mail address.

6 Q. That's going to speed this up. All right.

7 A. Sorry.

8 Q. Not a problem whatsoever. We all thank you for that.

9 I'll just do one more row to make sure we're all on the  
10 same page.

11 A. Sure.

12 Q. R\_SELECT\_LAST\_PERIOD\_DATE, were any names shared when that  
13 data was transmitted, deidentified, encrypted to Facebook  
14 Analytics?

15 A. No.

16 Q. Or any birth dates shared?

17 A. No.

18 Q. Were any e-mail addresses of any users shared?

19 A. No, never.

20 Q. And you've looked at the code yourself. In transit and in  
21 the source code file, was any personally identifying  
22 information shared with R\_SELECT\_LAST\_PERIOD\_DATE?

23 A. No.

24 Q. And was a key ever shared explaining the supposed meaning  
25 of R\_SELECT\_LAST\_PERIOD\_DATE?

1     **A.**    No.

2               **MR. SADUN:**  Your Honor, I'm marking this as  
3     Trial Exhibit 1274, simply being used for demonstrative  
4     purposes.

5               **THE COURT:**  Okay.

6               Demonstrative means it's not in evidence, just to help  
7     illustrate.

8               **MR. SADUN:**  Jody, would you kindly pull up Slide 24  
9     from Serge Egelman's PowerPoint presentation yesterday.

10              Your Honor, this was published previously by plaintiffs.

11              **THE COURT:**  All right.

12     **BY MR. SADUN:**

13     **Q.**    Were you in the courtroom when Dr. Egelman discussed this  
14     screenshot?

15     **A.**    Yes, I was.

16     **Q.**    I understood him to say that based on the code transmitted  
17     here, Flo is telling Facebook Analytics about users'  
18     symptoms and sex drive.

19              Do you agree with that?

20     **A.**    No, I don't.

21     **Q.**    Why not?

22     **A.**    Again, I feel like I'm being repetitive here, but it's an  
23     important point.

24              There's an illusion of accuracy here -- is that -- you  
25     can -- you see PLUS\_MENU\_ADD\_SEX and some stuff comes out in

1 the message stream, so it must be talking about sex. And maybe  
2 that's true; maybe that's not. You don't really know.

3 In fact, if you look at the choices, it ranges from  
4 "didn't have sex" to a whole bunch of other type of sex.

5 So within this function area are opposite functions,  
6 "didn't have sex" or "had sex." So if you just assume that  
7 every time you see that event it means some kind of sex is --  
8 has happened or is being reported, you'd be incorrect.

9 And it's worth recognizing that the reason this kind of  
10 thing is -- is happening is because the developers want to know  
11 when does the device fire this part of the app? When are --  
12 when is this being accessed? They don't care, really, what the  
13 answers are. They care that it's been navigated to.

14 Remember, earlier I pointed out the analytics SDK, one of  
15 main things is to understand is this code or function that you  
16 think people want being used. That's it.

17 Our intuition might be somebody cares about that data and  
18 what's inside, but the developers don't.

19 **Q.** I believe you may have just said in your prior response:  
20 Maybe you may know; maybe you don't know.

21 With the benefit of hindsight, seeing the actual  
22 transmission of code, do we know whether any information was  
23 actually revealed with the triggering of this app event?

24 **A.** Oh, that's a great point. Even knowing what this event is  
25 about, looking at this message traffic doesn't tell you what

1 the answer was. So even knowing it doesn't help you.

2 Q. So if a user had selected "protected sex," what would get  
3 transmitted?

4 A. Nothing. Just the event, just that the event fired.

5 Q. If a user selected "didn't have sex," what would get  
6 triggered?

7 A. Same thing.

8 Q. And how do you know that?

9 A. Oh, we measured it in the lab and saw what the app did in  
10 the real world.

11 Q. I'd like to end where we started, with the question:  
12 Based on everything --

13 MR. SADUN: Can we return to the PowerPoint, Jody.

14 BY MR. SADUN:

15 Q. Based on everything that you've reviewed and your 40-plus  
16 years of experience, do you agree with Dr. Egelman's assessment  
17 of the data Flo transmitted to Facebook Analytics?

18 A. I absolutely do not agree.

19 Q. And can you clarify why that is?

20 A. Well, the data that was transmitted was tied to devices,  
21 not people. Even though we can imagine a way that that could  
22 have been defeated, it was not, by Flo anyway or anything that  
23 the app did fundamentally.

24 And the data was encrypted and deidentified and also  
25 inherently unreliable and indecipherable without the context

## KARKANIAS - CROSS / LEVIS

1 and sometimes, as I just said, even with the context.

2 MR. SADUN: Thank you.

3 Thank you, Your Honor.

4 THE COURT: Okay. Cross?

5 CROSS-EXAMINATION

6 BY MR. LEVIS:

7 Q. Good morning, Mr. Karkanias.

8 A. Good morning.

9 Q. You don't have a degree in computer science; correct?

10 A. I do not.

11 Q. And you don't have a degree in computer engineering  
12 either, do you?

13 A. I don't.

14 Q. You don't have any formal certifications in computer  
15 science?

16 A. What kind of certifications -- I don't have any  
17 certifications in computer science.

18 Q. You've never developed any commercial tools for testing  
19 mobile applications, have you?

20 A. I have not developed tools for testing mobile  
21 applications.

22 Q. And you're aware this case is about a single app, the  
23 Flo app; correct?

24 A. The -- there's a single app at the heart of the case, but  
25 I don't -- I wouldn't characterize the case as only about the

1 app.

2 Q. And the Flo app is an app that runs on iOS and Android  
3 devices; correct?

4 A. Yes.

5 Q. You've never developed an app that's been released on the  
6 Apple App Store?

7 A. I -- well, I'll just remind you, I worked at Microsoft for  
8 10 years, and that team has developed many apps on the -- that  
9 were released on those platforms.

10 So if -- if you're saying me, personally, as a private  
11 citizen, no, I have not. But as a professional, I have been  
12 involved in the development and engineering of mobile apps  
13 since the beginning of the mobile platform through to today.

14 Q. Microsoft may have developed several apps that were  
15 released on the Apple App Store, but you, personally, have not  
16 developed an app that's been released on the Apple App Store;  
17 correct?

18 A. Well, I led the teams that developed those apps that --  
19 and I wrote code that was included in those, in that code base.  
20 So -- I don't know. I didn't personally write all the code  
21 that Microsoft has released, but I was involved in it in a  
22 significant way at a very high, executive level.

23 Q. And at an executive level managing people who worked on  
24 those projects?

25 A. As a developer. I was a developer. And Microsoft, as you

1 may know, is a very technical company that requires that our  
2 managers be as technical as the people they're managing.

3 Q. You never developed an app for the Android app store  
4 either, have you?

5 A. Personally?

6 Q. Personally.

7 A. No, not personally, but professionally, yes.

8 Q. You've never worked at Meta; correct?

9 A. I have not worked at Meta, that's correct.

10 Q. You've never worked on any of their internal systems or  
11 algorithms?

12 A. Meta's? No, I have not.

13 Q. And you didn't have an opportunity to inspect any of  
14 Meta's systems for processing information received from the  
15 Facebook SDK in the course of your analysis here, did you?

16 A. I -- you said opportunity. I could have, probably, but  
17 that was not the scope of my assignment.

18 Q. And you didn't actually analyze that, did you?

19 A. It was not in the scope.

20 Q. So that's a "no"?

21 A. That's a no.

22 MR. LEVIS: I want to -- if you can pull up  
23 Mr. Karkanias' presentation, please. I'd like to go to  
24 Slide 6. Maybe the next page. It's got the picture of the  
25 phones on it. Keep going. Keep going. One of these. Yeah,

1 stop here.

2 BY MR. LEVIS:

3 Q. On the left, this shows the hardware that you say you used  
4 to conduct this testing?

5 A. Yes.

6 Q. And there's three phones here? There's an iPhone SE, an  
7 iPhone 6, and a Galaxy S5; correct?

8 A. Yup.

9 Q. Those are the three devices that you used?

10 A. I don't think this is a -- this is an illustration, but I  
11 used those devices, yes.

12 Q. There aren't any other devices listed here that you used  
13 in your testing?

14 A. That's correct. I was just trying to understand if you  
15 were asking if this was the procedure. This is just a picture.

16 Q. Correct. This is a picture that identifies the devices  
17 that you used?

18 A. Yup.

19 MR. LEVIS: Okay. Can you go to Slide 18, please.

20 BY MR. LEVIS:

21 Q. I want to just talk specifically about the testing that  
22 you mentioned.

23 MR. LEVIS: Go back one, actually.

24 BY MR. LEVIS:

25 Q. So this is one of the slides you discussed on direct

1 relating to the traffic that you captured as part of your  
2 analysis; correct?

3 A. Yes.

4 Q. Okay. And this identifies, if you look at the second line  
5 on the log file, an iPhone 8 that was used to generate these  
6 logs; correct?

7 A. Yes.

8 Q. That's not one of three devices that we just looked at on  
9 the prior screen?

10 A. I see.

11 I'd have to look into why that's different. It could be  
12 just the OS level, not the -- the device name level.

13 Q. Where do you live?

14 A. Where do I live?

15 Q. Yeah.

16 A. I have a -- San Francisco.

17 Q. If you look at the next line here, you see that there is a  
18 time zone listed for the time the log was captured, and it says  
19 "America Chicago."

20 A. Mm-hmm.

21 Q. And it's actually -- if you look a few lines down, it  
22 appears as well, "U.S.A. America Chicago," indicating the time  
23 zone where the log was captured?

24 A. Yes.

25 Q. You would agree with me that Chicago is not in the same

1 time zone as San Francisco?

2 A. Sure.

3 Q. And if we look at this log a little bit further, you  
4 called out a single event here, R\_SELECT\_LAST\_PERIOD\_DATE?

5 A. Yup.

6 Q. You see below that there is R\_CHOOSE\_GOAL?

7 A. Yes.

8 Q. And the value Associated with R\_CHOOSE\_GOAL is "get  
9 pregnant"?

10 A. I see that.

11 Q. You don't dispute that that's the value of R\_CHOOSE\_GOAL?

12 A. No. In fact, I deliberately chose this message traffic to  
13 illustrate that you can have some event names as I believe I  
14 mentioned a few minutes ago, with payloads that include words  
15 like "get pregnant," but we -- without the benefit of  
16 additional information, we don't know what that means.

17 Q. You mentioned -- I think you used the term "the illusion  
18 of accuracy" in your direct?

19 A. Uh-uh.

20 Q. And you referred at that point to how, without additional  
21 information, you believe you would not be able to understand  
22 what this event means; correct?

23 A. Yes.

24 Q. Okay. With the benefit of the documents that have been  
25 produced in this case, you're not disputing, though, that the

1 event R\_CHOOSE\_GOAL and "get pregnant" is triggered by a user  
2 selecting "I want to get pregnant" from the first question on  
3 the Flo app survey screen?

4 **A.** I am not disputing that, no.

5 **MR. LEVIS:** Can you go to the next slide, please.

6 **BY MR. LEVIS:**

7 **Q.** And on this example, you also highlighted a single event  
8 here. It says R\_PREGNANCY\_WEEK\_CHOSEN in two places; correct?

9 **A.** Yes.

10 **Q.** And if you look closer at this screen, you can also see  
11 that there is SESSION\_CYCLE\_DAY\_FIRST\_LAUNCH there.

12 Do you see that?

13 **A.** Yes.

14 **Q.** Okay. And the value there is "CYCLE\_DAY\_TYPE."

15 It says "pregnancy" in plain text; correct?

16 **A.** Where are you reading?

17 **Q.** It is seven lines from the bottom. It's almost halfway  
18 down the page?

19 **MR. LEVIS:** Thank you for the highlighting.

20 **THE WITNESS:** Yes, thanks for the highlighting.

21 Session cycle day -- yeah. Okay.

22 **BY MR. LEVIS:**

23 **Q.** And you're not disputing that this was transmitted to  
24 Meta?

25 **A.** This is data that the app transmitted. I'm not disputing

1     that.

2             However, it says cycle day 43. I chose 10. I don't know  
3     how 43 makes sense.

4             You know, if -- even if week 7 was correct, 7 times 7 is  
5     49, so it's -- I just want to point out the -- we can sort of  
6     look at this like -- almost like a Rorschach or tea leaves and  
7     see what we want, but without certain knowledge, it's very  
8     difficult to know what it means.

9     **Q.**    And you're not disputing, though, then, that the next  
10    value cycle day 43, which is immediately following "pregnancy,"  
11    was transmitted to Meta either; correct?

12    **A.**    I am only pointing out that it's hard to understand what  
13    "cycle day 43" means because just mathematically, I can't  
14    connect it to anything that I know I did here by entering week  
15    10.

16    **Q.**    Did you analyze the code to figure out how your answer to  
17    this specific question resulted in this specific data on the  
18    screen?

19    **A.**    Yeah. We tried to -- I tried to trace the bug and  
20    couldn't find it.

21             Now, of course, there's a -- you know, a much larger  
22    developer team than just me, and Flo's engineers had a bug in  
23    here too.

24    **Q.**    I want to look at some of the other events here as well.  
25    You see there's an event R\_CHOOSE\_GOAL?

1     **A.**    On this same -- yeah, I see it, about five lines down.

2     **Q.**    And the goal there says "pregnant"?

3     **A.**    Oh, further down.  Further up it doesn't say anything.

4     Further down it says, yeah, "pregnant".

5     **Q.**    And you're not disputing that the goal chosen of

6     "pregnant" was transmitted to Meta?

7     **A.**    My only comment about this is that the -- those words have

8     no context.  So if you're asking me am I disputing whether

9     context-free words were sent to Meta, I'm not disputing that.

10            But I am trying to emphasize it's only an illusion of  
11     accuracy that we know that this means someone is choosing the  
12     goal of trying to become pregnant because we know that, but  
13     someone receiving this without any additional knowledge might  
14     not know that.

15     **Q.**    You don't know, though, the context that was available to  
16     Meta when they received this data; correct?

17     **A.**    I have seen no evidence that there was any context made  
18     available at any time to anyone except for the key that was  
19     generated during this -- during litigation.

20     **Q.**    Well, that's not what I asked you.  I asked you:  You  
21     don't know the context available to Meta?

22     **A.**    Well, I think I said -- answered you.

23            I -- I don't -- I have not seen context being made  
24     available to anyone, including Meta, except for the key that  
25     was generated for the purposes of litigation.

1 Q. You testified earlier, though, that you didn't have an  
2 opportunity or you actually didn't review the systems that Meta  
3 used to process this information once they received it;  
4 correct?

5 A. That's correct.

6 Q. You don't know what they did with that information once it  
7 reached Meta's servers?

8 A. I don't know what they did once it reached their servers.  
9 That's correct.

10 Q. You don't know what other data they joined it with;  
11 correct?

12 A. Correct.

13 Q. You don't know what other information they had about the  
14 users they received the information from; correct?

15 A. Only to the extent -- on that last part, only to the  
16 extent that I have seen no evidence that Flo had any such  
17 information to transmit to Meta other than that.

18 But it's true, I don't know what is inside the walls of  
19 Meta, of course.

20 Q. You testified a bit about whether the data was  
21 identifiable.

22 Do you recall that?

23 A. Yeah.

24 Q. Okay. And it was your opinion that the information  
25 transmitted with advertising identifiers was not identified?

1     **A.**    Yes.

2     **Q.**    You're aware, though, that Meta used that to join the  
3    information it received from Flo app users to individual users'  
4    Facebook profiles; correct?

5     **A.**    Well, we just -- we just had a small discussion about the  
6    fact that I'm not aware of what Meta has done.

7             **MR. LEVIS:**   Can we pull up Trial Exhibit 226 A4,  
8    please.

9             This was admitted into evidence yesterday.

10            **THE COURT:**   Okay.

11    **BY MR. LEVIS:**

12    **Q.**    Okay.   This is a copy of 226 A4.   This is a copy of Meta's  
13    verified response to plaintiff's interrogatory Number 1.

14            Do you see that?

15    **A.**    I do.

16    **Q.**    This is actually one of the files that you cited in your  
17    report as a document that you relied on.

18    **A.**    Yes, I recognize it.

19    **Q.**    Okay.   I'd like to look at the second paragraph.

20            **MR. LEVIS:**   We can pull that up.

21    **BY MR. LEVIS:**

22    **Q.**    And it says (as read):

23            "When the Flo app sent app events data to Meta,  
24            it also sent Meta information corresponding to the  
25            app events for the sole purpose of matching the

1 individuals associated with the Flo app app event  
2 data to individual Facebook users."

3 Do you see that?

4 **A.** I do.

5 **Q.** Okay. And it continues (as read):

6 "The information the Flo app may have sent to  
7 Meta via the SDK for matching purposes were apps'  
8 device identifiers and Android advertiser ID or an  
9 Apple ID for advertisers or a Facebook ID."

10 **A.** Sure.

11 **Q.** Okay. That was the same Apple identifier that you talked  
12 about earlier on direct?

13 **A.** Yes.

14 **Q.** Okay. And in this document, Meta is explicitly stating  
15 that that information was sent for matching purposes for the  
16 purpose of matching that information to individual users'  
17 Facebook profiles; correct?

18 **A.** Yes, that is correct.

19 However, I thought you were asking me if I had personal  
20 knowledge of what Meta did. I don't. I -- via these  
21 documents, sure. I mean, it's quite clear what they're saying  
22 in this interrogatory, but that's -- that's not my firsthand  
23 experience.

24 **MR. LEVIS:** Okay. You can take the document down.

25 \\\

1 BY MR. LEVIS:

2 Q. You mentioned encryption briefly?

3 A. Encryption, yes.

4 Q. And one of the things you mentioned was encryption -- I  
5 think you gave the example of HTTPS from your browser?

6 A. Yup.

7 Q. That's referring to encryption in transmission; correct?

8 A. Mm-hmm.

9 Q. So the data is encrypted as it goes from the app to Meta's  
10 servers in your example; right?

11 A. No. I was just using that as a -- as an analogy or an  
12 example for the jury to understand what I meant by encrypting  
13 the traffic.

14 When -- when I looked at the message traffic itself, it  
15 was -- if you can pull up one of the slides that -- well,  
16 you'll remember there's just strings and strings of characters  
17 that are not easy to read. That's the native way the data  
18 looks. It's essentially encrypted.

19 Q. The data is decrypted when it reaches the other side,  
20 though; correct?

21 A. After -- after it's received by where it's going, yes.  
22 Yeah.

23 Q. So when Meta received the information, that data would not  
24 be encrypted once it reached their servers?

25 A. I didn't analyze what Meta does with the data, but

1 logically, that's the case, yes.

2 Q. You talked about device identifiers being potentially  
3 resettable as well. Do you remember that?

4 A. Yup.

5 Q. You didn't conduct any -- any survey or testing to  
6 interview Flo app users to see how many reset their ad  
7 identifiers?

8 A. No.

9 Q. And you don't have any evidence that any Flo app users  
10 reset their advertising identifiers during the class period?

11 A. One way or the other, I don't have any evidence.

12 But the fact that it could happen means you can't rely on  
13 the device identifier as an absolute -- it would be as if you  
14 and I could change our phone numbers at any time. You don't  
15 necessarily know the next time you try to call me that you will  
16 reach me.

17 Q. Well, I'm not asking you about the possibility of whether  
18 it could happen. I'm asking you if you have any evidence it  
19 actually did happen. And you don't; correct?

20 A. That's correct. I didn't survey the population at all.

21 Not to be argumentative, but the point I'm trying to make  
22 is if you're trying to draw a conclusion about how much a  
23 particular identifier -- your phone number or the device ID --  
24 maps to you, the mere fact that it might not lends into  
25 question how tight that coupling is.

1 Q. Yeah, except for the fact that without knowing if anyone  
2 actually did this, you have no way of actually concluding that  
3 anyone in the Flo app population did not have an identifier  
4 that mapped directly to them; correct?

5 A. I don't know it definitively. It's -- all I'm saying is  
6 it's the possibility that is the concern.

7 Q. I'd like to talk about some of the comments you made about  
8 the data in the Flo app possibly being unreliable.

9 Do you remember that?

10 A. Yup.

11 Q. You didn't actually review any of the Flo app data that  
12 Meta received; correct?

13 A. You mean, after they received it?

14 Q. Correct.

15 A. That's correct.

16 Q. And you did not survey Flo app users to determine how many  
17 answered questions accurately or inaccurately; correct?

18 A. I didn't review it -- the users, but I reviewed Flo's  
19 documents that indicated about 15 percent of the population  
20 were males exploring the app on behalf of their own knowledge  
21 or partners and so on. So there is an indicator that there's  
22 some signal differences.

23 Q. You don't have any evidence, though, that any men entered  
24 information into the app?

25 A. Aside from Flo's report, you mean?

## KARKANIAS - CROSS / LEVIS

1 Q. Well, I mean, there's two different things. You just  
2 testified that you saw documents suggesting there's 15 percent  
3 of app users were men; correct?

4 A. Yes.

5 Q. And you're aware there's a partner mode where users can  
6 share access to their account so they can view their cycles  
7 with their spouse or partner; correct?

8 A. Sure. But what I -- the report I'm referring to is -- if  
9 I recall correctly was indicating that their data is skewed  
10 because they're entering data in -- you know, into the app.

11 Q. You didn't review any data --

12 A. I didn't review --

13 Q. -- that suggested that men entered data into the app;  
14 correct?

15 A. Only that report.

16 Q. And you didn't get on a phone and call up any of the  
17 purportedly 15 percent of male users to ask them if they put  
18 into the app any data; right?

19 A. No. I do remember reading a news article that someone's  
20 spouse was deliberately entering false data into the app as  
21 sort of an activism kind of thing, and if one person could do  
22 it, more than one person could do it. So I suppose --

23 But I definitely -- to preempt your question -- your next  
24 question, I definitely did not survey the population to confirm  
25 that.

1 Q. And that article you read, that's about one guy?

2 A. I don't recall exactly. I just -- it just -- you sparked  
3 a memory when we were talking about this.

4 Q. The Flo app's been downloaded something like 60 million  
5 times?

6 A. Okay.

7 Q. You'd agree with me, though, that the purpose of the  
8 Flo app is create accurate predictions for women so they can  
9 monitor their cycle, though; right?

10 A. That's its intent; yes, of course.

11 Q. And you were in the -- in the galley for the last several  
12 days?

13 A. Yeah, two days.

14 Q. And you heard five women get up here and testify how they  
15 used the app to track their period, their pregnancy, and their  
16 menstrual cycle for themselves so that they could get accurate  
17 predictions about their bodies; correct?

18 A. No, I actually wasn't here for the plaintiff testimony,  
19 most of it. But I understand what you're saying and do not  
20 disagree.

21 Q. Oh, I want to touch on another point you made about the  
22 use of SDKs to develop apps responsibly.

23 Do you remember you started out with that?

24 A. Mm-hmm.

25 Q. You're aware no one is disputing the use of SDKs generally

1 in this case?

2 A. Okay. Yeah, sure.

3 Q. You testified, I think, that it would have been  
4 irresponsible for the Flo app -- or Flo to develop the Flo app  
5 without analytics SDKs.

6 Do you recall that?

7 A. I do.

8 Q. You're aware that Flo removed all of the analytics SDKs  
9 from the Flo app in 2019; right?

10 A. Right.

11 Q. And they removed that because Apple threatened to kick  
12 them off of the App Store --

13 A. Right.

14 Q. -- if they continued to share health data through  
15 third-party apps; correct?

16 A. Sure.

17 Q. That was about six years ago?

18 A. Mm-hmm.

19 Q. The Flo app still functions today?

20 A. I -- I have not investigated the Flo app outside of the  
21 class period.

22 MR. LEVIS: Nothing further.

23 THE COURT: Okay. Any brief redirect?

24 MR. SADUN: Yes, Your Honor.

25 THE COURT: I'm sorry. I want to ask -- it's your

## KARKANIAS - REDIRECT / SADUN

1 understanding that Flo, the app, removed all SDKs from its  
2 product in 2019?

3 **THE WITNESS:** I -- I didn't investigate the Flo app  
4 outside of the class period, so if that happened --

5 **THE COURT:** 2019, I think, was the date. Was that  
6 your understanding that that happened?

7 **THE WITNESS:** I actually don't know when the analytic  
8 SDK was removed from the Flo app.

9 **THE COURT:** But leaving the date aside, is it your  
10 understanding that Flo removed all SDK code and lines at some  
11 point?

12 **THE WITNESS:** I'm only learning this right now from  
13 counsel.

14 **THE COURT:** Okay. All right.

15 **THE WITNESS:** So I really focused only on the class  
16 period and the app footprint then.

17 **THE COURT:** Go ahead.

18 **REDIRECT EXAMINATION**

19 **BY MR. SADUN:**

20 **Q.** You mentioned, a few times in response to questions from  
21 plaintiffs' counsel, unless you had a key, the transmitted code  
22 would not make sense.

23 What did you mean by a "key"?

24 **A.** Oh, so like a look-up table or something that explained  
25 what the app event is meant to convey in terms of navigational

1 information, like which button it meant or what the payloads  
2 might mean, things like that.

3 Q. Did Facebook Analytics, during the class period, have a  
4 key?

5 A. Not to my knowledge.

6 Q. Would having a key even tell Facebook Analytics who a user  
7 was?

8 A. No.

9 Q. There were questions about a partner mode. Flo introduced  
10 the partner mode in 2023, four years after the class period;  
11 correct?

12 A. Right.

13 Q. You also mentioned the spouse of someone in an article  
14 intentionally entering malicious data. That was actually the  
15 husband of plaintiffs' expert Dr. Golbeck, wasn't it?

16 A. That's right. I remember now.

17 Q. You were asked on cross-examination about your not having  
18 certifications or a computer science degree.

19 What experience do you have building mobile applications?

20 A. Sure. Let me preface this with -- you know, I understand  
21 the need for certifications and degrees and all that. And  
22 really, it's important to recognize without such mechanisms,  
23 it's hard to know whether someone is trained enough or skilled  
24 enough to do the job that you're going to hire them for, so we  
25 have a mechanism to certify people.

1 But just like I was making the example of you don't know  
2 what the source code is going to do until you really test it,  
3 you really don't know what somebody's going to be able to do  
4 until you see what they've done.

5 So for me, it's far more valuable to see that, you know,  
6 for the past 40 years I've been building software engineering  
7 solutions and teams and so on, not just as any old company, but  
8 at giant companies that specialize in their areas, and I'm --  
9 it's very difficult for me to talk about myself. My default  
10 state is humble, which is not compatible with sitting on the  
11 stand here and projecting all the stuff that I do, but I've had  
12 a stratospheric career, and not just one career, but two or  
13 three different careers that no amount of certification or  
14 Ph.D.s would have predicted would be possible.

15 So in short, I think it's -- not to be too lecture-y about  
16 this, but I think it's just important to look at my background:  
17 10 years at Microsoft, ten years approximately at a big pharma,  
18 ten years in the startup world, five, six years in another  
19 startup that -- revolutionizing healthcare, another year or two  
20 presently. I've been coding since it was possible to code, and  
21 I continue to this day.

22 Q. Plaintiffs' counsel asked you about Facebook potentially  
23 matching device IDs.

24 Could Facebook, from a technology perspective, ever know  
25 for certain who was behind any device ID?

1   **A.**   No.  It's -- we can contemplate all kind of probabilistic  
2   matching kinds of things.  Like, for example, counsel,  
3   you know, looked at the message traffic and said:  Oh, it's  
4   Chicago but you live in San Francisco, so what does that mean?

5           And we could make up what -- what does that mean.  But you  
6   can't know until you sort of investigate, you know, that's  
7   where the lab is located or -- or the pipe that the traffic  
8   came through.

9           So no matter what exercise you come up with, it's going to  
10   be a guess.

11   **Q.**   And you looked at the code in transit as well as the  
12   source code files.  Did you see anything in the code suggesting  
13   that Flo wanted Facebook to match device IDs?

14   **A.**   No.  No, there was no -- there's no need for it.  What Flo  
15   needed was that dashboard that indicated the navigational  
16   information in aggregate and what buttons were pressed.

17   They -- I saw no evidence in any process of any kind that Flo  
18   cared at all what the answers to the data was.  They wanted to  
19   know, for all the reasons I hope I've explained, what buttons  
20   were pressed so that they could improve the app.

21           And apparently they improved the app such that there were  
22   60 million downloads of it, which is -- doesn't happen by  
23   accident.

24   **Q.**   If a man were to use the Flo app -- you said 15 percent of  
25   users are speculated to be men -- would they be entering the

1 same first-launch questions?

2 A. It depends -- yeah, they would have to. There's no  
3 avoiding those questions.

4 Q. Would they have to say whether --

5 A. They were pregnant.

6 Q. -- their goal is to get pregnant?

7 A. Yeah. I had to do the same thing. Right? I'm not  
8 pregnant. I wasn't then. I'm not now.

9 Q. Has counsel for Facebook at any point in time in this  
10 litigation paid you even one penny?

11 A. Say that again?

12 Q. Has plaintiff -- sorry. Has --

13 Over here we have counsel for Facebook.

14 A. Yes.

15 Q. Have they paid you anything?

16 A. No. I'm just so shocked at the idea. No, not at all.

17 Q. Did they discuss or talk with you whatsoever while you  
18 were drafting your reports and reaching your opinions?

19 A. Absolutely not.

20 Q. And based on your extensive experience and testing in this  
21 case, have you seen any evidence indicating that Flo ever sent  
22 personally identifiable information through the Facebook's  
23 analytics SDK?

24 A. They absolutely never did.

25 MR. SADUN: Thank you, Your Honor.

## ZERVAS - DIRECT / CLUBOK

1 Thank you.

2 THE COURT: Okay. You can step down.

3 THE WITNESS: Thank you.

4 (Witness excused.)

5 THE COURT: Who do we have next?

6 MR. CLUBOK: Good morning, Your Honor. Andrew Clubok  
7 for Facebook. And we're calling the next witness, Dr. Georgios  
8 Zervas.

9 THE COURT: Okay. Let's take our little standing  
10 stretch break.

11 (Georgios Zervas steps forward to be sworn.)

12 (Pause in proceedings.)

13 THE COURT: Okay.

14 THE COURTROOM DEPUTY: Raise your right hand.

15 GEORGIOS ZERVAS,  
16 called as a witness for the Defendants, having been duly sworn,  
17 testified as follows:

18 THE WITNESS: Yes, I do.

19 THE COURTROOM DEPUTY: Thank you. Please be seated.  
20 Please state your full name and spell your last name.

21 THE WITNESS: My name is Georgios Zervas. Last name  
22 Z-E-R-V-A-S. G-E-O-R-G-I-O-S.

23 DIRECT EXAMINATION

24 THE COURT: Go ahead.

25 MR. CLUBOK: Your Honor, some quick housekeeping.

## ZERVAS - DIRECT / CLUBOK

1 By stipulation the parties have agreed to admit  
2 Exhibits 603A, 1241, 1246 --

3 THE COURT: I don't have any of those. Is there a  
4 binder for me?

5 MR. CLUBOK: Your Honor, the reason we're doing this  
6 now and because there's no binder is these are all APKs or  
7 code. They're massive documents.

8 THE COURT: Oh. All right.

9 MR. CLUBOK: Yeah -- or screenshots that we've agreed  
10 to from those documents.

11 THE COURT: Give those to Ms. Clark.

12 MR. CLUBOK: Sure. I think I said 1241, 1246, 1247,  
13 and 1276. I believe those would be the only exhibits we  
14 inquire about.

15 THE COURT: Okay with that, plaintiff?

16 MR. LEVIS: No objection.

17 THE COURT: Okay. They're all admitted.

18 (Trial Exhibits 603A, 1241, 1246, 1247, and 1276 received  
19 in evidence.)

20 BY MR. SADUN:

21 Q. Good morning, Dr. Zervas. Could you introduce yourself to  
22 the jury, please.

23 A. Good morning, Mr. Clubok. Good morning. My name is  
24 Georgios Zervas.

25 Q. Where do you live, sir?

## ZERVAS - DIRECT / CLUBOK

1    **A.**    I live in Boston.

2    **Q.**    Are you originally from Boston?

3    **A.**    As you can tell, I'm from Greece.

4    **Q.**    What do you do for a living?

5    **A.**    I am an associate professor of marketing at Boston  
6    University, where I am also jointly appointed at the faculty of  
7    computing and data sciences.

8    **Q.**    And I'll try hard to talk loud and slow, and if you could  
9    do the name thing, that would be great.    Okay?

10   **A.**    Of course.

11   **Q.**    Do you have -- I see you have a demonstrative  
12   presentation.    Have you prepared something to assist in  
13   explaining your opinions to the jury?

14   **A.**    I have some slides.

15   **Q.**    Okay.    And do you have a slide that summarizes your  
16   academic and professional experience that's relevant to this  
17   case?

18   **A.**    I do.

19   **Q.**    Okay.    Well, let's start.    First of all, you're currently  
20   a professor at Boston University.    Do you have tenure?

21   **A.**    I do.

22   **Q.**    And you say you're jointly appointed in both the marketing  
23   department and in the faculty of computer and data sciences?

24   **A.**    Correct.

25   **Q.**    How long have you been at BU?

1    **A.**    I joined BU at 2015.

2    **Q.**    And do you teach any classes that involve software  
3    development?

4    **A.**    I teach a course named Machine Learning for Business  
5    Analytics, and this teaches students both the theory of machine  
6    learning but also how to develop machine learning software.

7    **Q.**    Do you teach students -- do you teach that course to  
8    students in the undergrad level, the grad level, or both?

9    **A.**    So all of the above.  So I think it must have been  
10   approximately seven years ago, the business school had no  
11   technical course of this nature.  All of my background is in  
12   computer science, and I took the lead in developing a course in  
13   machine learning that our students in the business school would  
14   find useful.

15   **Q.**    Sticking with your professorship, can you explain a little  
16   bit about the faculty of computer -- or the, I guess, college  
17   of computer and data sciences and what exactly that is at BU?

18   **A.**    It's an unwieldy name.  It's the faculty of computing --  
19   I'm sorry.  There's a typo -- of computing and data sciences.

20           So this is a new department, a new unit that Boston  
21   University started a few years ago.  I was a founding faculty  
22   there, meaning I helped develop the curriculum, our graduate  
23   programs hire new faculty.

24           And as I became deeply involved with that, a while ago I  
25   split my appointments, so 50 percent of my effort currently is

1 in the business school as an associate professor of marketing  
2 and 50 percent of my effort is at the faculty of computing and  
3 data sciences.

4 **Q.** Do you do any academic research that involves software  
5 development or data transmission?

6 **A.** I do. My work is empirical in nature. It involves a lot  
7 of data collection, especially data from the web, from the  
8 Internet, I have studied big platforms like Tripadvisor,  
9 Expedia, Airbnb, Yelp. I collect and analyze data on my own  
10 using methods from statistics, econometrics, machine learning,  
11 causal inference, and whatever might be appropriate for the  
12 task at hand.

13 **Q.** In addition to teaching and research, do you have any  
14 other technology-related roles at BU?

15 **A.** So as I mentioned, recently BU founded this faculty of  
16 computing and data sciences. My primary role there, apart from  
17 teaching and research, is to be the director of online  
18 initiatives.

19 So like many other universities, Boston University is  
20 developing a suite of online programs, and I'm leading the  
21 effort to develop -- the curricular effort to develop BU's  
22 suite of programs in data science and AI.

23 Approximately a year ago, we launched our first  
24 programming, the online master's in data science.

25 **Q.** Does all this work in this field include experience with

1 SDKs, or software development kits?

2 **A.** Yes. Software development kits are collections of  
3 resources, lines of code, compilers, documentation that  
4 software developers use to build software, and this is  
5 something that I do -- okay, maybe with a bit of  
6 exaggeration -- every day for my research.

7 **Q.** There are a number of other organizations or institutions  
8 that you've got listed on your résumé here: Microsoft, Yale,  
9 MIT, Harvard.

10 Can you just briefly summarize your past experience before  
11 Boston University with these institutions or organizations?

12 **A.** I will try to do this. I will do this in chronological  
13 order.

14 So prior to joining BU, I was a postdoctoral fellow at  
15 Yale. This is between your Ph.D. and starting an academic  
16 career, you might get a bit more training, so I did that at  
17 Yale. And at the same time, I had an affiliate position at  
18 Harvard. I was visiting a research group there.

19 When I joined BU, after a few years, BU and all  
20 universities, they give you a bit of a break, a sabbatical, and  
21 I spent that at MIT as a visiting scholar.

22 For many years while I was a professor at Boston  
23 University, I was also a visiting researcher at Microsoft  
24 Research in Cambridge.

25 **Q.** Just for the record, because folks have been asked about

1 their educational degrees, do you have a degree in computer  
2 science?

3 **A.** I only have degrees in computer science.

4 **Q.** What are your degrees?

5 **A.** So I have a bachelor's in computer science from Imperial  
6 College in London. I have a master's in computer from Imperial  
7 College in London. I also have a degree in interactive media  
8 from the London College of Communication, and I have a Ph.D. in  
9 computer science from Boston University.

10 **Q.** Outside of research and teaching, are you involved in any  
11 other professional services or work that relates to the topics  
12 we're discussing today?

13 **A.** Yes. As part of my work, I have to do and enjoy doing  
14 some internal and external service. The external service  
15 primarily involves sitting on editorial boards of leading  
16 journals in the field or sitting on program committees of  
17 conferences. And my role there is -- these are the outlets  
18 where we researchers publish our work through a process known  
19 as peer review. And through my involvement in these  
20 activities, I review a lot of work, I provide technical  
21 feedback, and I guide these papers, together without --  
22 together with other years, through the publication process.

23 **Q.** Have you written peer-reviewed articles in prestigious  
24 publications in your field?

25 **A.** I always try to publish in leading journals and

1 conferences in my field.

2 Q. And have you been able to do that?

3 A. And I have been able to do that.

4 Q. And have you been what's called a peer reviewer for others  
5 who submit articles to the top journals in your field?

6 A. Yes. This is commonplace. Others have to review my work,  
7 and in return, you know, I offer my time to review people's  
8 work.

9 Q. Outside the academic world, have you done anything -- what  
10 some would say the real world, but other than in the academic  
11 setting, have you done any private business -- any work in  
12 private business that relates to the technology field?

13 A. I've always vacillated between the real world and  
14 academia, so before joining BU, I was running a small  
15 information technology consulting firm called Perlfect  
16 Solutions. So this is "perfect" with a misspelling; there is  
17 an L after the R, and it's a -- Perl is a programming language,  
18 so back then we thought it was a cute name.

19 Q. Perl is a programming language. Do you program computers  
20 yourself? Do you know how to?

21 A. I do.

22 Q. How much -- how many lines of code would you estimate  
23 you've written in your 20-plus years of experience?

24 A. I mean, it's definitely hundreds of thousands. Probably  
25 millions.

## ZERVAS - DIRECT / CLUBOK

1           **MR. CLUBOK:** Your Honor, I'd like to tender Dr. Zervas  
2 as an expert witness in software development kits and data  
3 sharing and in machine learning.

4           **THE COURT:** Any objection?

5           **MR. LEVIS:** No objection.

6           **THE COURT:** All right. He's qualified on this those  
7 topics.

8 **BY MR. CLUBOK:**

9 **Q.** Okay. Now, sir, you've reached opinions in this case that  
10 you're prepared to share with the jury today.

11 **A.** I have.

12 **Q.** Can you summarize for the jury the opinions you formed  
13 based on the work you've done in connection with this case?

14 **A.** I have a slide, and I'm just going to read the slide.

15           So first, app developers commonly use and benefit from  
16 software development kits, including Facebook's SDK.

17           Second, Dr. Egelman mischaracterizes how SDKs work.

18           And third, Dr. Golbeck -- and you will hear from  
19 Dr. Golbeck a bit later -- misrepresents how machine learning  
20 models work.

21 **Q.** To be clear, Dr. Golbeck is another expert that the  
22 plaintiffs' lawyers hired who's scheduled, I guess, to testify  
23 next week; right?

24 **A.** That's my understanding.

25 **Q.** But you have to get back to Greece, so you're testifying

## ZERVAS - DIRECT / CLUBOK

1 now; correct?

2 **A.** I have a family medical issue, and I appreciate the  
3 flexibility.

4 **Q.** Okay. So let's get back to your opinions.

5 Let's talk about how you arrived at your opinions. What  
6 did you do? What did you review? What did you rely on?

7 Try to summarize that briefly, but make sure the jury gets  
8 whatever is important for them to know.

9 **A.** I have a slide that explains what I relied upon, the  
10 different materials.

11 So I relied on case-specific documents. Think of this as  
12 documents that were created because there is litigation, so the  
13 complaint, depositions, and interrogatories would be examples  
14 of case-specific documents.

15 **Q.** Can I stop you?

16 What -- can you explain -- because we've heard this phrase  
17 "interrogatories" -- and I'm not asking for a legal explanation  
18 of it, but in layman's terms or in terms of an expert who  
19 reviews interrogatories for court cases, can you explain to the  
20 jury what means?

21 **A.** You can think of it as a Q and A. So there is a question  
22 that counsel asks, and then there is a response below that's  
23 written in detail. And I'm not a lawyer, but I think they have  
24 some rules about how they do that.

25 **Q.** So the questions from the plaintiffs to the defendants and

1 vice versa that are answered in the course of litigation in  
2 writing?

3 A. Correct.

4 Q. And you've reviewed the interrogatory responses that are  
5 relevant to your opinions; correct?

6 A. I have.

7 Q. What about --

8 THE COURT: Jurors, you will get a little instruction,  
9 jury instruction, that defines an interrogatory for you. Okay?  
10 Go ahead.

11 MR. CLUBOK: Thank you.

12 BY MR. CLUBOK:

13 Q. And what about expert reports? Can you explain just very  
14 briefly what that is and if it's part of the case-specific  
15 documents that you reviewed to prepare the opinions?

16 A. So I have reviewed expert reports of Dr. Egelman and  
17 Dr. Golbeck that I rebut. And expert reports, it's the work  
18 that -- it's the --

19 THE COURT: Okay. We can skip that part.

20 Next question.

21 MR. CLUBOK: Thank you.

22 BY MR. CLUBOK:

23 Q. How about just briefly continue through the rest of the  
24 materials that you relied upon.

25 A. I also relied upon company documents. These would be

1 documents produced by Meta or by Flo. Academic literature,  
2 public documents. For instance, the documentation for the  
3 Facebook SDK. Transmission logs, both those produced by  
4 Dr. Egelman but also transmission logs that I collected.

5 And finally, I reviewed source both for the Facebook SDK  
6 and different versions of the Flo app.

7 Q. You said you reviewed Dr. Egelman's transmission logs;  
8 right?

9 A. Correct.

10 Q. Those are logs that reflected whatever his --

11 Well, why don't you explain what they were, as far as you  
12 could tell.

13 A. So Dr. Egelman did some testing and then collected some  
14 transmissions from, I presume, the devices he used where he ran  
15 the Flo app that were sent to Meta, and these logs, they  
16 contain these transmissions.

17 Q. Did the transmission logs reveal the actual app event data  
18 that was sent back in the day during the class period from  
19 Flo Health to any of its SDK providers?

20 A. No.

21 Q. So what was the data and the transmission logs based upon,  
22 as far as you understand from reading Dr. Egelman's reports or  
23 listening to him testify?

24 A. It reflected Dr. Egelman's interactions with the app and  
25 whatever transmissions were produced due to that.

## ZERVAS - DIRECT / CLUBOK

1 Q. So were you here in court when he said that he had made  
2 his own inputs to generate basically, I guess, test data to  
3 show what he thinks would have happened if a user had entered  
4 in different things back in the day?

5 A. I was, and I heard that, yes.

6 Q. Now, he also -- were you here in the courtroom when  
7 Dr. Egelman said that he believed that he -- strike that.

8 Were you here when Dr. Egelman said that he had kept notes  
9 that he said reflected what those inputs were that generated  
10 the logs that you saw?

11 A. I was. I heard that.

12 Q. And did you hear Dr. Egelman say that he believed those  
13 notes that would have showed whatever inputs he put in were  
14 shared with the defense team?

15 Do you remember that?

16 A. I do.

17 Q. Were those notes, in fact, shared with defendants?

18 A. I have not seen them. I have asked for them, and they do  
19 not exist.

20 Q. And have you asked the defense counsel to see if they had  
21 them anywhere in their files?

22 A. When I say I asked for them, I'm sorry. That's what I  
23 meant.

24 Q. Okay. How about the actual app event data? Why did  
25 you -- did you review that, the actual app event data that's --

## ZERVAS - DIRECT / CLUBOK

1 for example, Ms. Wellman's or Ms. Chen's or Ms. Gamino's or  
2 Ms. Meigs or Ms. Frasco's? Any of that data available to  
3 anyone in this case, as far as you know?

4 **A.** I did not review it, and it's not available to anyone in  
5 this case because Facebook has retention policies surrounding  
6 this data. So this data is deleted. At most, it is held for  
7 up to 180 days and then later is deleted. And this applies to  
8 all applicants' data, just to be clear, not just to Flo.

9 **Q.** And to be clear, we've talked about the class period.

10 Do you understand it to be very specifically run from  
11 November 1st, 2016, to February 28, 2019?

12 **A.** Yes, that matches my recollection.

13 **Q.** Okay. So when I ask you questions about the relevant time  
14 period or the class period, I'll ask you to answer based on  
15 that time frame of November 1st, 2016, to February 28, 2019,  
16 and if I say before the class period or after the class period,  
17 I'll ask you to use those dates as brackets. Okay?

18 **A.** Yes.

19 **Q.** Is it possible -- do you know of any way, any expert way  
20 that you could know, what the real communications were between  
21 Flo and any of the plaintiffs -- not just the five women who  
22 testified here but any plaintiffs during that class period?

23 **A.** The only way I can think of is to go and ask people, one  
24 by one, what buttons they clicked on the app. But to be clear,  
25 even that would not reveal the actual transmissions between

1 their phones at the time and wherever those transmissions went.

2 Q. Okay. So we've talked about everything you did and the  
3 work you did in the case. Let's get to your opinions. Back to  
4 your opinions.

5 First opinion. Can you explain to the jury the basis for  
6 your opinion and a little more information about what you  
7 concluded?

8 A. I have a slide on that, and I'm going to be brief because  
9 you heard the same thing by Mr. Karkanias and to a large extent  
10 by Dr. Egelman.

11 So software development kits. What are they? Lines of  
12 computer code and other resources like documentation about how  
13 to use them. And they're used by app developers to write  
14 software.

15 And I think, as everyone has said in this case, they're  
16 useful. They're reliable. They can help you do your job  
17 faster and potentially in a more secure and reliable manner.

18 Q. How common is it for apps to use code from software  
19 development kits during the class period?

20 A. I have three statistics that I will share with you.  
21 Again, Mr. Karkanias mentioned that to develop an app and  
22 publish it on the Apple store -- on the App Store, you need to  
23 use the iOS SDK.

24 Another study from 2018 found that 165,000 top apps in  
25 Google Play -- that's the Android store -- used code from an

1 average of 18 SDKs. So this tells you not only that they are  
2 popular, but app developers use many SDKs.

3 Q. And by the way, Dr. Zervas, if I'm kind of signaling like  
4 this, it's just to ask you to slow down a little bit for the  
5 benefit of the court reporter.

6 A. Thank you for the reminder.

7 Q. Okay.

8 How about the Facebook SDK in particular? How popular or  
9 how well used was the Facebook SDK roughly during the time  
10 period of the class?

11 A. So one study in 2017 found that 300,000 Android apps used  
12 code from Facebook's SDK.

13 Q. That's Android apps. What about Apple or iOS apps? Is  
14 that any different, as far as you know?

15 A. So the study doesn't speak to that, but I can estimate,  
16 because most apps that we use, they have an Android version.  
17 We also have an iOS version. And these are usually written by  
18 the same company. They probably -- the number is probably  
19 similar.

20 Q. You know, Mr. Levis, during the cross-examination of  
21 Mr. Karkanias, said something to the effect that -- and I'm  
22 trying to paraphrase. This is not the exact words.

23 But he said something like do you know that we're not  
24 challenging SDKs generally; we're just supposedly challenging  
25 how they worked in this case.

1 Did you hear him say something like that?

2 **A.** To the best of my recollection.

3 **Q.** Let me just ask you something.

4 Based on all the work you've seen, did Facebook do  
5 anything different at all in connection with how Flo used the  
6 Facebook SDK compared to how Facebook would have operated for  
7 any of the other hundreds of thousands of apps during this time  
8 frame? Anything different from Facebook's perspective that you  
9 saw?

10 **A.** I wouldn't even put it like that. Facebook puts out the  
11 SDK, and it's the same for all developers to use. And then  
12 developers take the SDK and incorporate it however they find it  
13 useful in their own apps, but developers have access to the  
14 same SDK.

15 **Q.** Okay. Let's talk about why developers might want to use  
16 SDKs, in particular analytics SDKs.

17 Can you explain that?

18 **A.** I have another slide on that. And, again, I will be brief  
19 because you've heard some of that before.

20 First of all, what is analytics? It's statistics that you  
21 might want to collect about your app or your website.

22 And as we collect statistics, you might discover some  
23 patterns. Some features might be popular; some features might  
24 be defective, and then you can take steps to improve your app  
25 or your website.

1           Additionally, some apps and some websites, we all know  
2           that they run ads, and analytics SDKs can be used to optimize  
3           ad campaigns.

4   **Q.**    Let me just ask you:

5           During this time period, was Facebook's SDK publicly  
6           available?

7   **A.**    It was.

8   **Q.**    And this documentation that explained how it operated, was  
9           that publicly available?

10   **A.**   It was.

11   **Q.**   Was it any secret at all that Facebook's SDK could be used  
12           if people want to to help optimize ad campaigns?

13   **A.**    It's spelled out in the documentation as one of the  
14           intended functionalities.

15   **Q.**   Has Facebook ever hidden the fact that it has advertisers  
16           and it can help use analytics to optimize ad campaigns, as far  
17           as you know?

18   **A.**    I would be very surprised. I think, actually, Facebook  
19           wants people to know that they can advertise on Facebook.

20   **Q.**   Okay. Let's continue with what academic studies you've --  
21           you've reviewed regarding why developers might use SDK with  
22           analytics.

23   **A.**    So these are some studies and some stories I have told  
24           you. In science we also conduct studies. And here I cite an  
25           academic study that I know well and I think is reliable.

1           And this explains to you what happened when a number of  
2       firms integrated analytics dashboards. And the study finds  
3       causally -- in other words, it was exactly because of the  
4       analytics dashboards -- that they managed to improve the  
5       customer relationship management, and consequently, that led to  
6       increased revenue, at least in this study, between 4 and  
7       10 percent.

8       **Q.** But in this case, that increased revenue you're talking  
9       about -- that's for the developer who uses the analytics;  
10      correct?

11      **A.** This is for the firms that integrate analytics dashboards.

12      **Q.** So if developers advertise on Facebook, that's good for  
13      Facebook, I presume?

14      **A.** Presumably it's also good for the developers. Why would  
15      the developers do something that's not good for them?

16      **Q.** Okay. Let's continue to your second opinion.

17           Can you describe -- and I see there's more information on  
18      the slide now. You've got an A and B under your Opinion 2.

19           Can you explain that to the jury, please?

20      **A.** I'll try to take that slowly because there are a lot of  
21      words on the page.

22           So I mentioned that my second opinion is that Dr. Egelman  
23      mischaracterizes how SDKs work, and I want to tell you two ways  
24      this happens.

25           A, Facebook has no access or control over the SDK once

1 it's included in any app.

2 **Q.** Can I just stop you there?

3 Is that opinion only with respect to how Flo Health used  
4 its app, or does that opinion apply, as Mr. Levis mentioned,  
5 generally to everybody who uses the Facebook SDK?

6 **A.** I used the words "any app" there specifically for that.  
7 It applies to any app.

8 **Q.** Okay. Continue on, please.

9 **A.** And then B, the communications between the Flo app and its  
10 users are distinct from the custom app event data that the  
11 Flo app created and later transmitted to Facebook.

12 **Q.** Okay. Why don't you explain a little more --

13 Actually, before you get to your opinions, can we just  
14 take a step back and maybe you can walk the jury through  
15 exactly how Facebook's SDK would have been used by developers  
16 during that time frame.

17 And try to teach it to the undergrads instead of the  
18 grads. Okay? If you can.

19 **A.** Sometime my undergraduates are much better than my  
20 graduate students. So let's teach that to the grads. All  
21 right.

22 So suppose you are a software developer. That's you and I  
23 along the bottom of my slide. And we're creating an app. And  
24 then we want to incorporate some functionality into our app.  
25 Maybe we want to take some payments. Maybe we sell something.

1 Maybe we sell groceries or subscriptions or who knows what.

2       Instead of building a payment processing functionality  
3 bottom-up, ourselves, and spending a lot of time doing that  
4 and, you know, introducing bugs, we might go and download an  
5 SDK and incorporate that functionality in our app.

6       Maybe we also want to incorporate analytics functionality  
7 in our app for the reasons I told you before. We would  
8 download probably a different SDK that focuses on analytics.

9 **Q.**   Okay. And where would you download this from?

10 **A.**   So one very popular place that software developers go to  
11 download SDKs and other open source software is called GitHub.  
12 Think of that like a public library, if you will. Anyone can  
13 walk in and grab something and then use it.

14 **Q.**   But in GitHub, unlike a public library, if you grab the  
15 SDK, is it still available for everybody else to come along and  
16 use?

17 **A.**   This is one benefit of digital goods. So just like an MP3  
18 for music, you know, many people can have the same thing.

19 **Q.**   Would Facebook's SDK be available anywhere else besides  
20 GitHub?

21 **A.**   Facebook's SDK is also available from Facebook itself.

22 **Q.**   Is that normal for analytics SDK providers to make their  
23 software development kits publicly available?

24 **A.**   So typically they make it available on their websites.

25 And if they're open source, it's common to also publish them on

1 websites like GitHub.

2 Q. You've used this phrase "open source." Can you try to  
3 explain what that means in this context, open source?

4 A. Of course. I know it's two words and they carry a lot of  
5 weight, so first let me tell you what "source" is.

6 So "source" are the instructions that software developers  
7 write to implement, to create the code. So this is something  
8 like programming language, like Python or C, and you type that  
9 into your computer, and that's the source.

10 "Open" means that these source instructions that you, as  
11 the developer, wrote are publicly posted on GitHub, for  
12 example, for others to read, download, inspect, and even modify  
13 to tailor their needs.

14 Q. After a developer downloads the Facebook SDK, what  
15 happens?

16 A. I'm sorry. It's a slow download.

17 (Laughter.)

18 Q. Okay.

19 A. And finally it's here.

20 Q. You've now got Slide 11 up, and there's an excerpt from  
21 Exhibit 1246, which is in evidence.

22 Can you describe what we're seeing here?

23 A. Yes. And I'm going to walk you over this slide slowly.  
24 It looks complicated, but really it's not. So let me tell you  
25 what it contains.

1        So here, this is an excerpt, a small piece, from one file  
2        in the Facebook SDK.

3        So we, the developers, have downloaded this file. It's  
4        now on our computer. We open the file like with a text editor.  
5        Think of it like Word, but for programmers.

6        And it contains two things at a high level. The lines  
7        along the top with a stars, this is documentation. It tells  
8        users of the SDK, app developers, how to use this particular  
9        function.

10       The colorful words below, the lines starting with stars,  
11       this is the actual code that is inside the SDK that developers  
12       can use.

13       **Q.**    And we obviously know that Flo downloaded the Facebook SDK  
14       to help develop their app; correct?

15       **A.**    Correct.

16       **Q.**    Did Flo download -- as far as you know, would there have  
17       been any different version available to Flo at the particular  
18       moment they downloaded that would have been available that  
19       current version to any of the hundreds of thousands of apps who  
20       could have used the open source code from Facebook?

21       **A.**    At any point in time app, developers have access to  
22       exactly the same versions of the Facebook SDK. I suppose  
23       someone can always go grab an old version if they want, but  
24       that would not be best practice.

25       **Q.**    Is there any secret about these instructions or the exact

1 lines of usable code that would be available at any point in  
2 time for any app developer like Flo or anybody else to come  
3 download?

4 **A.** No.

5 **Q.** Okay. Why don't you continue explaining what we're seeing  
6 here on Exhibit 1246, please.

7 **A.** Great. So now we know how to read the documentation. We  
8 see the goal below. Let's read the documentation together to  
9 see what it tells us to do. We're developing our app.

10 I'm going to read the top highlighted line. It says "log  
11 an app event with a specified name and set of parameters."

12 And by this point in this case, probably you know that  
13 this is a function that can be used to log an event.

14 Now, how did you do that? We can read a bit further. So  
15 now I'm reading from the second highlighted line. It says  
16 "Choose amongst the event name star constants when possible."

17 **Q.** What does that mean?

18 **A.** Thank you for asking.

19 So when developers incorporate the Facebook SDK into their  
20 apps, they have to decide what events to log. There are two  
21 types of events, at least, one -- that are mentioned here.  
22 There are two types of events that are mentioned here, to be  
23 precise:

24 So-called standard events. These are events that are  
25 common to many apps, like "add to cart" or "purchase." So

1 these are used by many app developers. So the SDK provides the  
2 names for these.

3 And then I will continue reading my documentation here.  
4 If none of these standard app event names work for us because  
5 we're doing something more specific to us, it says "Or create  
6 your own if none of the event name star constants are  
7 applicable."

8 Q. Who is the "us" in that sentence?

9 A. Us, the developers.

10 Q. Okay. And we've heard a lot about custom app events in  
11 this case. Is that the custom app event?

12 A. The second sentence that says "create your own," that's  
13 custom. So developers can choose a custom app event name to  
14 suit their needs.

15 Q. Did Flo incorporate Facebook's SDK code into their app?

16 A. I have a couple of slides to show you how that works.

17 Q. Okay. Why don't you continue.

18 So we're now in Slide 12. Why don't you just try to  
19 explain best you can to the jury what we're seeing here.

20 A. I appreciate it's getting more and more complex. I  
21 promise you we'll be done with the code soon.

22 So this is just a file from Flo's programming code. And,  
23 again, I want to call your attention to just three things, and  
24 I will try to take it slowly.

25 First, you see a long rectangle in light blue color. This

1 is a lot of code, but all it does -- this shows Flo app  
2 developers choosing a name for one custom app event.

3 What is the name? It is R\_SELECT\_PERIOD\_LENGTH. This is  
4 in quotes in orange. So they have chosen a name.

5 Now let's move to the box just below. There is a yellow  
6 box, and you can see two words that stand out, "known" and  
7 "unknown."

8 These are potential parameters that can be transmitted  
9 together with this custom app event by developers.

10 Finally, I'm going to skip over a few things. There is a  
11 green box at the bottom, and this is a function. You can think  
12 of a function as a step in the code, in the logic of the Flo  
13 app. It's call LOG\_SINGLE\_EVENT.

14 And what's important to note here is what comes just after  
15 it. You see R\_SELECT\_PERIOD\_LENGTH.

16 So this step in the code, it takes the custom app event  
17 name and any parameters that developers created before and does  
18 something with it.

19 **Q.** Okay. You were here yesterday when I tried -- I kept  
20 asking Dr. Egelman with respect to his slides to try to -- I  
21 kept trying to say to him or asked him multiple times can you  
22 show me anywhere in your slides where you've actually showed  
23 the SDK code.

24 Do you remember when I kept asking him?

25 **A.** I remember.

1 Q. And he finally admitted that there was no SDK code in his  
2 slide deck; right?

3 A. Right.

4 Q. Okay. So we're going to do the same thing -- fair's fair.  
5 I'm going to do the same thing to you as we go through these  
6 lines of code. I'm going to ask you at various places where,  
7 if at all, the lines of code that were downloaded via the --  
8 from the publicly available Facebook SDK appear. Okay?

9 A. Yes.

10 Q. So if I forget to ask you, just raise your hand and say  
11 there's the SDK or reusable code. Okay?

12 A. Understood.

13 Q. So on this page here on Slide 12, what you've just  
14 described in the blue and the yellow and the green boxes, any  
15 code written by Facebook, even -- is an open source code or  
16 publicly available code?

17 A. None. And I want to be very clear. You see these  
18 star-star-star?

19 These are excerpts that I wanted to highlight to explain  
20 how these things work. There is a lot more code behind the  
21 star-star-stars. This is also written at this points by Flo  
22 app developers.

23 Q. And to be clear, this Flo programming code, which has been  
24 marked as Exhibit 1241 -- what we have up on the screen is just  
25 a tiny, tiny excerpt of the giant electronic file that we've

1 actually lodged with the Court; correct?

2 A. Correct.

3 Q. Okay. And so -- yeah, I'm glad you brought those  
4 star-star-stars.

5 Where you've skipped over anything, just for demonstrative  
6 purposes, is there any -- if someone were to go look at that  
7 electronic file and read line by line by line where you've put  
8 the three stars, would they ever see at this stage of the  
9 development process the code that was made available by  
10 Facebook that they've called the Facebook SDK code?

11 A. No.

12 Q. Okay. And so all the way through the green box and  
13 whatever you've left out, but is in the electronic files, if  
14 someone really wanted to look at it -- no Facebook-written  
15 code; correct?

16 A. Correct.

17 Q. And so this words of SELECT\_PERIOD\_LENGTH and the  
18 parameters of "known" and "unknown," as far as you've seen, any  
19 input or any writing of that by Facebook, as far as you've  
20 seen?

21 A. It's not even as far as I have seen. I have seen and it's  
22 written by Flo app developers.

23 Q. And is this the normal way it's done for all of hundreds  
24 of thousands of developers who use the Facebook SDK?

25 A. That's how -- I don't want to speak for others, but that's

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1 how SDKs are intended to be used. They are controlled by  
2 developers to accomplish specific functional tasks.

3 Q. Okay. Let's continue --

4 THE COURT: Okay. Let's take our morning break, and  
5 we'll be back at 11:25.

6 THE COURTROOM DEPUTY: All rise.

7 (The jury leaves the courtroom.)

8 (Proceedings were heard out of the presence of the jury.)

9 (Recess taken at 11:02 a.m.)

10 (Proceedings resumed at 11:27 a.m.)

11 (Proceedings were heard out of the presence of the jury.)

12 THE COURTROOM DEPUTY: All rise. This court is back  
13 in session. The Honorable -- this court is back in session.

14 THE COURT: We're back in session.

15 Okay. What do we have next?

16 MS. OZUROVICH: Your Honor, Allison Ozurovich on  
17 behalf of Flo. Before --

18 THE COURT: Hey, hey, hey. Everyone can sit down,  
19 please.

20 MS. OZUROVICH: Before we get started with  
21 Dr. Zervas' -- or continue with Dr. Zervas' testimony, we  
22 understand that plaintiffs would like to place their own  
23 deposition designations today from Flo's witnesses, and we have  
24 some outstanding objections.

25 THE COURT: Is it for today?

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1           **MR. CANTY:** No.

2           **OTHER ATTY:** Oh. For when?

3           **MR. CANTY:** The intent is to call Mr. Satterfield  
4 next, and then we intended to play some Flo deposition  
5 designations, about 20 minutes' worth. And  
6 counter-designations.

7           **THE COURT:** From a different witness?

8           **MR. CANTY:** Correct.

9           **THE COURT:** Who is that person?

10          **MR. CANTY:** There are three witnesses that we intend  
11 to call -- excuse me -- three videos we intend to call. It's a  
12 total of about 24 minutes. Those are Flo witnesses.

13          **THE COURT:** Three witnesses in 20 minutes?

14          **MR. CANTY:** It's just clips.

15          **THE COURT:** Oh, okay. In lieu of live testimony?

16          **MR. CANTY:** Correct.

17          **THE COURT:** All right.

18          What's the problem?

19          **MS. OZUROVICH:** We have outstanding objections to  
20 certain of the testimony, and so we wanted to resolve that  
21 before it gets played.

22          **THE COURT:** What are the objections?

23          **MS. OZUROVICH:** Your Honor, may I approach with the  
24 designations and the relevant exhibits?

25          **THE COURT:** Sure.

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1           **MR. CANTY:** Your Honor, plaintiffs have no objections  
2 to the designation or counter-designations.

3           **THE COURT:** Okay.

4           **MS. OZUROVICH:** So there are four exhibits for your  
5 context at issue and three deponents.

6           The first deponent is Eugene --

7           **THE COURT:** I'm not going to -- we have a jury waiting  
8 back there.

9           **MS. OZUROVICH:** Understood. Well, I'll be quick.

10          **THE COURT:** What is the objection? Is it relevance?  
11 What is it?

12          **MS. OZUROVICH:** With respect to Eugene, it's  
13 relevance, because he joined Flo in May 2019 as a senior  
14 acquisition manager, and so all of his testimony and personal  
15 knowledge relates to acts that happened after the class period  
16 and related to advertising after the class period.

17          So therefore we would say that the --

18          **THE COURT:** All right. What's the relevance?

19          **MR. CANTY:** Your Honor, every witness they want to  
20 call next week is from after the class period, and they say  
21 they are highly relevant. I mean, the advertising paradigm --

22          **THE COURT:** What are you going to ask him that's  
23 relevant to our time period?

24          **MR. CANTY:** It talks just -- he joined, but it talks  
25 about the advertising program. It doesn't specifically say it

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1 started when he began. It talks about the inferences that it  
2 was going on during the class period.

3 **THE COURT:** Does he say it's the same during the class  
4 period?

5 **MR. CANTY:** I don't have the specific transcripts in  
6 front of me, Your Honor. Again, we didn't have objections to  
7 the designations.

8 **THE COURT:** Well, I mean, so what's he going to say  
9 that's relevant to 2016 to 2019?

10 **MR. CANTY:** So with respect to Mr. Bugaev, he's going  
11 to testify that Flo decided to discontinue the use of other  
12 SDKs but not the Facebook SDK, and they continued to send  
13 onboarding and registration --

14 **THE COURT:** That's fine. That part is fine.  
15 What else?

16 **MR. CANTY:** With respect to Mr. Tiunovich --

17 **THE COURT:** Is that it for -- I'm going to get this  
18 wrong -- Bugaev?

19 **MS. OZUROVICH:** Well, we switched witnesses, but with  
20 respect to Mr. Bugaev, the exhibit that they want to play with  
21 his testimony specifically references the Wall Street Journal  
22 and is describing it as a "postmortem" on the Wall Street  
23 Journal. That's Exhibit 488 in the Redwell that I just handed  
24 you.

25 **THE COURT:** I assume you're going to be waving the

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1 Wall Street Journal at some point. Is that not true?

2 **MS. OZUROVICH:** Well, I think the difference, Your  
3 Honor, is that our understanding of your order on the motion in  
4 limine was that the Wall Street Journal article related to  
5 notice with respect to the statute of limitations. This is an  
6 internal -- it appears to be -- Mr. Bugaev didn't necessarily  
7 endorse it, but it appears to be an internal communication  
8 about the response to the Wall Street Journal article, which is  
9 again, beyond the class period and also akin to a subsequent  
10 remedial measure in that it's discussing the changes that they  
11 made --

12 **THE COURT:** That's not a subsequent remedial measure.  
13 That's for sure. So I'm not going to do that.

14 Subsequent remedial measure is when you fix the sidewalk.  
15 That's not what this is.

16 Okay. I don't know. I can't do this in a vacuum. So  
17 just play it.

18 **MR. CANTY:** Thank you, Your Honor.

19 **THE COURT:** If it looks bad, I'll stop it.

20 **MR. CANTY:** Thank you.

21 **THE COURT:** Okay. Who are the other two?

22 **MS. OZUROVICH:** The next is Mr. Scrobov.

23 **THE COURT:** Scrobov. Okay. Now, what's he being  
24 called for?

25 **MR. CANTY:** He will testify as being responsible for

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1 the -- the -- working on the design and user experience at Flo.  
2 And in his position, he will talk about understanding what  
3 interests should be delivered to Flo app users.

4 It talks about using the custom app events to enhance the  
5 experience for app users.

6 **THE COURT:** Enhance the experience for users?

7 **MR. CANTY:** Yes. These are the women that were using  
8 the app.

9 **THE COURT:** So what's wrong with that?

10 **MS. OZUROVICH:** We just have a narrow objection to  
11 Mr. Scrobov's testimony. The document that they intend to use  
12 with him, Exhibit 321, Mr. Scrobov specifically testified at  
13 his deposition when shown that document, "I haven't seen this  
14 document before or I don't remember about it, so."

15 And so to use a document specifically with Mr. Scrobov --

16 **THE COURT:** 321? I don't have 321.

17 **MS. OZUROVICH:** I can give you my copy, Your Honor.

18 **THE COURT:** I have 326. Is it 326? Actually, 326 is  
19 empty.

20 Okay. Hand that to Ms. Clark.

21 **MS. OZUROVICH:** And I apologize, Your Honor. It has  
22 my internal notes. So the exhibit, if it were to be admitted,  
23 would not have that.

24 **THE COURT:** Do you not want me to see these?

25 What's the issue with this?

## PROCEEDINGS

1           **MS. OZUROVICH:** The issue is that they intend to use  
2 this document with Mr. Scrobov, who said that he hasn't seen it  
3 before and didn't remember about it.

4           Moreover, there's no author on the document. There's no  
5 Flo insignia.

6           So at this point, we don't think the foundation --

7           **THE COURT:** I got it. I got it.

8           **MR. CANTY:** Your Honor, this document was produced by  
9 Flo in discovery. It's a Flo document. And despite the fact  
10 the witness said he didn't see the document before, he answered  
11 questions intelligently about the substance of the document,  
12 and it flows with the dialogue.

13           **THE COURT:** It's not his document. Don't use it.  
14 Just skip that part. Okay?

15           He's not a 30(b)(6). It's based on personal knowledge.  
16 He doesn't know it. He didn't see it.

17           **MR. CANTY:** He answered questions about it, Your  
18 Honor.

19           **THE COURT:** How can he answer? What did he say?

20           **MR. CANTY:** Notwithstanding saying he didn't know,  
21 when he was asked questions --

22           **THE COURT:** Is it in here in these designations?  
23 Where would I find it?

24           **MS. OZUROVICH:** It is in his designations, Your Honor.  
25 And I would note the questions he answered were --

## PROCEEDINGS

1           **THE COURT:** Hold on. Where will I find it in here?

2           **MS. OZUROVICH:** It's on page 10 of the affirmative  
3 designations that we handed to you at the top of the page.

4           **THE COURT:** 10. Okay. Let's take a look. Scrobov?

5           **MS. OZUROVICH:** Yes.

6           **THE COURT:** Page 10? There's nothing on page 10 about  
7 a document.

8           **MS. OZUROVICH:** If you'll see lines 2414 through 2417,  
9 they're reading the document at him, and he's saying, "Yes, I  
10 see."

11           **THE COURT:** Is he referring to the document? When you  
12 say it says "Do you see it?" he's referring to this document?

13           **MS. OZUROVICH:** That's exactly correct, Your Honor.

14           **THE COURT:** Okay. You know, it looks like he might  
15 have just been reading from it, so skip that one. Okay? Take  
16 that portion out.

17           **MR. CANTY:** Okay.

18           **THE COURT:** All right. He doesn't know enough about  
19 it.

20           What's next? Who is the other person?

21           **MS. OZUROVICH:** The final one is Mr. Tiunovitch. I  
22 may be saying that incorrectly.

23           **THE COURT:** All right. What's the issue with him?

24           **MS. OZUROVICH:** That's the witness, Your Honor, that  
25 joined Flo in May of 2019, and could only speak in his personal

## PROCEEDINGS

1 capacity from May 2019 and beyond, which is obviously months  
2 after the class period.

3 **THE COURT:** Okay. Plaintiff?

4 **MR. CANTY:** Your Honor, as I stated before, he talks  
5 about the advertising intentions and the attempt to get new  
6 users, and nowhere does he indicate that this was a new policy  
7 or procedure that he was working under post-class period.

8 **MS. OZUROVICH:** And --

9 **THE COURT:** It just says, I'm referring to 2020-ish.  
10 It's a year after the class period.

11 What's the hook? What's the hook? What's the connection?  
12 He doesn't have to say. You have to. You have to establish  
13 the connection.

14 How is he talking about anything relevant to the class  
15 period?

16 **MR. CANTY:** Well, there's nothing to indicate that the  
17 comment had changed, Your Honor.

18 **THE COURT:** I just -- well, he wasn't asked that.  
19 There's nothing that -- the right question is what indicates  
20 that his testimony would fit the prior period, and I don't see  
21 anything here.

22 **MS. OZUROVICH:** And, Your Honor, if I may --

23 **THE COURT:** Hold on. I'm waiting for your colleague  
24 to respond.

25 **MR. CANTY:** Your Honor, to put a finer point on it,

## PROCEEDINGS

1 with respect to the advertising, they were talking about the  
2 goals that are at issue in this case, the R\_CHOOSE\_GOAL, and --

3 THE COURT: Where is that?

4 MR. CANTY: Well, that's -- that's what the  
5 advertising --

6 THE COURT: Well --

7 MR. CANTY: -- in 2020.

8 THE COURT: I mean, it's just not the right time  
9 period. So what's the bridge?

10 MR. CANTY: Well, R\_CHOOSE\_GOAL, the allegations in  
11 the class period is that they were collecting that information  
12 and sending it to -- allowing Meta to collect that information.

13 THE COURT: So I've heard. That's the class period;  
14 right? Not this guy.

15 MR. CANTY: So the conduct had not stopped. It was  
16 continuing post-class period.

17 THE COURT: There's no foundation here for that.  
18 There's no question saying is this just the same as it was  
19 before you started at the company. There's nothing here like  
20 that; right?

21 MR. CANTY: Not in the --

22 THE COURT: Yeah.

23 MR. CANTY: Not in the document --

24 THE COURT: Okay. He's out.

25 Okay. Let's bring the jury in. Take all this back.

## ZERVAS - CROSS / CLUBOK

1 (The jury enters the courtroom.)

2 (Proceedings were heard in the presence of the jury.)

3 **THE COURTROOM DEPUTY:** Please be seated.

4 We are back on the record in Civil 21-757, Frasco versus  
5 Flo Health.

6 **THE COURT:** Okay. I have the two proposed questions.  
7 I'm just going to put them on ice until we're done with the  
8 entire testimony. All right? Maybe they get answered, maybe  
9 they won't. I don't know. Let's see where we are and then  
10 I'll decide what we're going to do with these two.

11 So I do have them. I'm not ignoring them. Just going to  
12 delay them for a little bit.

13 Okay. Go ahead.

14 **MR. CLUBOK:** Thank you, Your Honor.

15 **CROSS-EXAMINATION**

16 **BY MR. CLUBOK:**

17 **Q.** Dr. Zervas, you were -- I think you had finished Slide 12,  
18 and I think I was about to ask you or maybe I had just started  
19 asking you what comes next.

20 **A.** That's right. Let's get back to programming.

21 So let's just --

22 **Q.** Back to your regularly-scheduled programming.

23 **A.** To connect what we were doing before to what I'm going to  
24 show you next, as a brief reminder, we're still looking at Flo  
25 programming code that has defined a custom app event and some

1 parameters.

2 At the very end, the green box is still Flo programming  
3 code that passes that custom app event name to this step,  
4 LOG\_SINGLE\_EVENT. So let's see what happens next. Okay?  
5 That's where we are.

6 **Q.** And now you're on Slide 13. What are we looking at here?

7 **A.** So looking from the top to the bottom, we see more Flo  
8 programming code. And there is only one line that I want to  
9 call your attention to. This is the line in the orange  
10 rectangle, and I'm just going to read it for you.

11 It says "This .facebooklogger.logevent."

12 Then parentheses, and you see inside the parentheses two  
13 things. You might remember from a couple of slides ago this  
14 log event function we were discussing from the Facebook SDK.

15 I want to be very clear: All these letters that I add,  
16 everything in the orange box, is still written by Flo app  
17 developers.

18 And to say it colloquially, this is the Flo app developers  
19 reach out to the Facebook SDK and saying: Hey, SDK. Can you  
20 help us transmit this custom app event that we chose with the  
21 parameters we chose to Facebook?

22 **Q.** Okay. We'll get to that. We'll get to -- and I want to  
23 get to what the code that comes from Facebook actually does  
24 once it's incorporated to the app.

25 But let's continue with the Flo -- or with the code that

1 we see on the screen. What is shown under the orange box on  
2 Slide 13?

3 **A.** So up to and including the orange box, this is code that  
4 Flo app developers wrote. Below the orange box, this is code  
5 from the Facebook SDK.

6 How can you tell? If you see those little greater or  
7 equal signs just below the orange box, you see how one of them  
8 says "Facebook"? This is like a folder. The other one says  
9 "app event." So this is Facebook SDK code that deals with app  
10 events.

11 **Q.** Okay. And is this code -- does this code have any impact  
12 on how the Flo app operates in the real world?

13 **A.** To be specific, if you're talking about the code below the  
14 orange box, this code does nothing on its own. Someone has  
15 to ask it to do something. That someone in this particular  
16 case, through the various steps that I describe, is Flo app  
17 developers and, more broadly, app developers. It's the same  
18 for everyone.

19 **Q.** Okay. And what happens next?

20 **A.** Now, what I have shown you is still source code. App  
21 developers understand source code. Strangely, computers do  
22 not. So you have to take this source code and translate it  
23 into the proverbial ones and zeros -- okay -- that computers  
24 understand.

25 This --

1 Q. I'm sorry to interrupt, but the ones and zeros, is that  
2 referred to as machine code?

3 A. You can call it machine code. It's a compiled set of  
4 instructions that is run on your phone when you open the app.

5 Importantly, this is a single cohesive set of  
6 instructions. At this point, the Facebook SDK does not exist  
7 as an independent entity inside the computer code. It's one  
8 program that is running. The app that you opened -- not the  
9 app that you opened and the Facebook SDK separately. It's used  
10 for development. It's common. It's in the previous slides.

11 Q. And, again, any different for Flo app as compared to how  
12 everybody else incorporate SDK open source code into their  
13 apps?

14 A. Apart from the specific examples that I mentioned in the  
15 ways app developers customize app event names, the general  
16 process is the same.

17 Q. You said -- I'm sorry.

18 Well, what are you showing on the screen now?

19 A. So I'm showing some of what we talked about. So this is a  
20 user interacting with the Flo app. They're taking certain  
21 actions in the background. The Flo app code is running on your  
22 phone, and one of the many things it does, it generates some  
23 app events data.

24 Q. And it looks like in this example, the user is typing  
25 February 27th -- or pushing it, I guess, on the app?

1   **A.**   They're tapping on the phone. They're answering the  
2   question "When did your last period start," and they're  
3   entering -- they're choosing something like February 27th.

4   **Q.**   Okay. And I know you've described the machine code now  
5   for the app as one big code, but is there any code that came  
6   from Facebook's open source originally that is at this point  
7   recording "February 27th"?

8   **A.**   No.

9   **Q.**   What does the code that originally came from Facebook  
10   that's been now incorporated into those zeros and ones -- what  
11   is it going to do in connection with the app?

12   **A.**   There are two important things to remember. The first  
13   thing is the Facebook SDK is not running independently,  
14   separately from the app at this point. It's the app running  
15   and it has -- when I say "incorporated," think of it as  
16   absorbed. Okay? It has absorbed some useful pieces of code  
17   from the SDK that do nothing on their own. The developer can  
18   instruct those pieces of code to, in this case, transmit app  
19   events data to Facebook.

20   **Q.**   So what happens after the Flo user interacts with the  
21   Flo app and the Flo app generates app event data? What happens  
22   next?

23   **A.**   So I want to show you first -- and you have seen it  
24   before -- what the app events data looks like.

25         So in this particular example, and this is just an

1 example, it says along the top the highlighted yellow, it tells  
2 you the event name. It's R\_SELECT\_LAST\_PERIOD\_DATE. And I  
3 have also highlighted the parameter that goes together with  
4 this event. It's "known."

5 You might remember that "known" when Flo app developers  
6 defined it a few slides ago.

7 Q. And, again, is this -- this is an excerpt from one of  
8 Dr. Egelman's test logs?

9 A. This is an excerpt that I selected from Dr. Egelman's  
10 logs.

11 Q. Do you know what date Dr. Egelman typed in order to  
12 generate all of this data that gets -- we'll talk about what  
13 happens with this data, but if you look down and you see what's  
14 generated there, if you just looked at that and you didn't have  
15 the picture up of somebody pushing "February 27th," would you  
16 be able to come through that anywhere and find out whether or  
17 not -- you know, what number was pushed in order to achieve  
18 that "known" output?

19 A. So I want to be very clear. The answer is no. And here  
20 is why: The log events data that gets the app events data --  
21 I'm sorry -- that gets generated does not include buttons or  
22 screen taps or things like that.

23 It contains the custom app event names and any parameters  
24 that the Flo app developers chose to transmit.

25 This is not where you would look for what button was

1 pressed. And to make it abundantly clear, this screen that I  
2 selected, it's just for illustration. I'm not even saying that  
3 this screen, someone pushed 27. I just didn't know what it was  
4 and I had to select something to complete my example.

5 Q. Do you even -- okay.

6 Is there any -- let's say you scoured this -- even with  
7 20/20 hindsight, one of Dr. Egelman's logs.

8 Is there anything in there that can identify what date he  
9 pressed to generate the value "known," as far as you can tell?

10 A. As far as I can tell, no. And also, I know that this is  
11 not what transmission logs are meant for.

12 Q. And have we got -- have you seen the inputs that  
13 Dr. Egelman did do to generate this log?

14 A. No.

15 Q. Okay. Well, what happens next?

16 A. So I chose my words carefully here. The data has been  
17 generated. It has not been transmitted yet. So we have one  
18 final step.

19 Now, the user interacts with the app. The app generates  
20 app events data. And I'm going to use, I think, what is --  
21 technical analogies, you always lose some fidelity, but I think  
22 this is a good one.

23 Imagine you have an envelope and it's pre-addressed for  
24 convenience. I have these at work. They say Boston  
25 University, and I don't have to write my name on them.

1 By using the SDK, the app developer says "Take these app  
2 events that I generated and stick them in this pre -- empty  
3 pre-addressed envelope."

4 The envelope is still not being sent. Why? It's a big  
5 envelope and it fits more stuff.

6 So for efficiency, so your battery is not drained and your  
7 phone doesn't become slow, we put a lot of stuff in this  
8 envelope, and when it's full, it's transmitted from the Flo app  
9 to Facebook.

10 Q. Now, whether or not it takes milliseconds or seconds or  
11 days, does that change your opinion?

12 A. Not at all. I just described how the technology works.

13 Q. You -- you've been here in court over the last few days  
14 when plaintiffs' lawyers have repeatedly told their clients and  
15 asked Dr. Egelman whether Facebook recorded -- or they've  
16 sometimes said "when Facebook recorded" the data from  
17 Flo Health.

18 What is your reaction to that?

19 A. I would say that again -- and that's important for me to  
20 describe clearly, as someone who works with these technologies.

21 The Facebook SDK cannot record anything because it doesn't  
22 exist independently as a separate entity on your phone at that  
23 point. The Flo app developers used the software development to  
24 accomplish a task; in this particular case, transmitting custom  
25 app events from the phone to Facebook.

1 Q. In all your years in the field and all the peer-review  
2 studies you've reviewed and all the students you've had and all  
3 the visiting fellowships or visiting scholarships you've had  
4 with other faculties, other than Dr. Egelman, have you ever  
5 heard anyone in your field claim that the -- in your field  
6 claim that the Facebook SDK was recording in the way that  
7 you've heard it described in this court?

8 A. Look, we all make mistakes, and I have heard -- including  
9 myself, and I have heard many things that are wrong, but that  
10 particular statement -- I have never heard anyone describe the  
11 Facebook SDK as a recording device.

12 Q. Okay. Let's go to the next -- and I think next opinion or  
13 next point under this opinion. Can you describe that?

14 A. Now I'm looking at Opinion 2B, and I'm going to read it  
15 one more time (as read):

16 "The communications between Flo app and its  
17 users are distinct, two different things, from the  
18 custom app event data that the Flo app created and  
19 later transmitted to Facebook."

20 Q. Okay. I want to focus again on the 12 custom app events  
21 that are actually at issue in this case. As least start with  
22 that. And we've put up on Slide 16 the familiar now 12 events  
23 from R\_CHOOSE\_GOAL to SESSION\_CYCLE\_DAY\_FIRST\_LAUNCH and the  
24 other 10 in between.

25 Do you see that?

1     **A.**    I see that.

2     **Q.**    So to be crystal clear to the jury, for each one of these  
3     custom app events, there were some data or some parameters that  
4     were set that were at least intended to be sent to SDK  
5     providers; right?

6     **A.**    Correct.

7     **Q.**    For any particular Flo Health user, how many times would  
8     you -- the way the code is written would they be expected to  
9     have information about one of these 12 custom app events sent  
10    to SDK analytic providers?

11    **A.**    So as you recall, there is a set of questions you have to  
12    answer the first time and only the first time you open the app.  
13    These events are sent then and only then, the first time you  
14    open the app.

15    **Q.**    So at least the way the app is designed, setting aside  
16    whether there was a bug or if it didn't work the way it was  
17    designed, but from what you can tell, is it designed -- let's  
18    say someone installed it in 2016, and used it for five more  
19    years.

20            Is it designed to keep sending any of the information  
21    relating to any of these 12 at-issue custom app events, as far  
22    as you could tell?

23    **A.**    No. The only exception I have in mind, and this would be  
24    unusual, would be something like someone uninstalling the app,  
25    then installing the app, and then going through these questions

1 again. But for a single installation of the app, these events  
2 would only be transmitted once.

3 Q. Okay. And I know we've spent a lot of time on these, but  
4 let's at least briefly go through all 12. We'll do them in  
5 groups. Let's start with the first five.

6 These first five, what we have here are screenshots that  
7 the jury has seen some various versus of these before for  
8 R\_CHOOSE\_GOAL, R\_SELECT\_LAST\_PERIOD\_DATE,  
9 R\_SELECT\_PERIOD\_LENGTH, R\_SELECT\_CYCLE\_LENGTH, and  
10 R\_AGE\_CHOSEN\_PERIOD as reflected on Slide 17.

11 Do you see that?

12 A. I do.

13 Q. And for each of these, it's displayed samples of what it  
14 would have looked like to the user at a particular time if they  
15 had actually had the app downloaded on their phone; correct?

16 A. Correct.

17 Q. And by the way, over the class period -- which, again, was  
18 from November 1st, 2016, to February 28, 2019 -- were there  
19 different versions of the app that changed the questions that  
20 were asked or how it appeared over the course of that time  
21 period?

22 A. Correct. There were.

23 Q. And to the best of your ability, have you tried to look at  
24 all of the available versions during that class period to  
25 compare how things might have been changed or been different

1 over that time?

2 **A.** I want to be slightly more precise. Not every single  
3 version, but as you heard yesterday, Dr. Egelman tested a bunch  
4 of versions, and I tested those same versions.

5 **Q.** So you've at least looked at all the ones he looked at to  
6 try to see if you could recreate or double-check his work; is  
7 that fair?

8 **A.** I tried to recreate his work to the best of my ability  
9 using the materials I had.

10 **Q.** Understand.

11 And I don't want to beat a dead horse here, but you  
12 weren't able to totally recreate his work because you didn't  
13 have his inputs; correct?

14 **A.** My results are different.

15 **Q.** Okay. In any event, for each of these five custom app  
16 events that are at issue in this case, did the SDK operate in  
17 any way to record the conversations or communications between  
18 Flo Health and its users?

19 **A.** No.

20 **Q.** All right. Let's talk specifically about R\_CHOOSE\_GOAL,  
21 the one all the way to the left.

22 R\_CHOOSE\_GOAL has, in this version, two options: "I want  
23 to get pregnant" and "I just want to track my cycle."

24 Do you see that?

25 **A.** I see that on the screen.

1 Q. And do you see the words that were on the screen as  
2 compared to some words of the string that have been extracted  
3 kind of look familiar; right? "Get pregnant," "track cycle"?  
4 At least, I guess, those four words appear somewhere in the  
5 screen of this version that's shown on Slide 17; right?

6 A. I want to acknowledge that they look similar. I would not  
7 use the word "extracted" based on my review of the code. And I  
8 think I showed you that these are defined separately.

9 Somewhere, somewhere else, Flo app developers decided that  
10 this first option on the top under "How we can help you" is "I  
11 want to get pregnant."

12 Somewhere else in the code, they have another string that  
13 says literally "I," space, "want to" and so on and so forth.

14 Different things.

15 Q. And was that particular communication between Flo Health  
16 and its users even shared with Meta, let alone recorded by  
17 Meta?

18 A. No.

19 Q. Okay. We've talked about the knowns and unknowns and how  
20 those were the words that were transmitted in those strings  
21 with respect to the three middle ones.

22 I just want to clarify on the fourth one.

23 R\_AGE\_CHOSEN\_PERIODS. In this example you have on your screen,  
24 it looks like the user is about to type "1999." Okay? And  
25 let's say that person did so today, when it's 2025.

1           That "1999," would that be communicated to Flo Health?

2   **A.**   No.

3   **Q.**   I'm sorry.  Would that "1999" -- I pointed at the  
4   plaintiffs and I may have been confusing.

5           When the user pushes "1999" while it's communicating with  
6   Flo Health, would that "1999" have also been communicated with  
7   Meta?

8   **A.**   They are two distinct conversations, to use the language  
9   from yesterday.

10          What are the conversations?

11          Let's say I'm the Flo app users -- user.  I'm, let's say,  
12   talking to the app.  Not my favorite analogy, but let's go with  
13   it.

14          How am I talking to the app?  By making these choices with  
15   my finger.  All right?

16          There is a separate -- that's why I use the word  
17   "distinct."  Again, I chose it carefully.

18          There is a distinct communication then that goes from the  
19   Flo app to Meta.  These are two distinct things.

20          Moreover, to answer your question, in this particular  
21   case, it's not 1999 that gets transmitted to Meta.  The reason  
22   I say calculated number --and I think you heard that yesterday  
23   as well -- it takes the current year, 2025, minus 1999, and it  
24   sends 16.  Okay?  26.

25   **Q.**   You don't teach math, do you?

1           So my birthday is in December. If I put in "1999" right  
2 now and got the 26, would that accurately reflect my age?

3           Well, it wouldn't for a lot of reasons. But let's say  
4 there was someone who was -- I'm sorry.

5           Let's say there was someone whose birthday was in  
6 December, and today they push "1999" on this version of the  
7 app. What number would be sent or intended to be transmitted  
8 to Meta?

9   **A.**   Well, regardless -- my birthday is also in December, and  
10 regardless of what day of the year you're born, the number is  
11 the same, so it's going to be wrong for some people.

12 **Q.**   So if this -- if your birthday was in December of 1999,  
13 you'd still only be 25; correct?

14 **A.**   Correct.

15 **Q.**   But the number that would go to Meta, regardless of  
16 whether your birthday had already happened in the year or the  
17 birthday happened later, would be 26; right?

18 **A.**   Based on my review of the source code, yes.

19 **Q.**   And in other versions of the code that Dr. Egelman showed  
20 yesterday, sometimes it would send a range.

21           Did you see that too?

22 **A.**   Yes, I saw that.

23 **Q.**   Okay. And did Meta have any control over which -- whether  
24 it was the actual year, 1999, or it was a precisely calculated  
25 number or a calculated number that was wrong half the time or a

1 range, did Meta have any ability to control that?

2 **A.** No, because Flo app developers incorporate the SDK into  
3 the apps. They use it. They control it. They decide what  
4 gets transmitted.

5 It's like an envelope, and you put what you want inside  
6 the envelope. You don't have to use those. You can just go  
7 buy your own envelope. It would be more work.

8 **Q.** Okay. And I want to focus on the screen on the left.

9 For all the class period where there was only two options  
10 available, "I want to get pregnant" and "I just want to track  
11 my cycle," would any information about some of those other  
12 custom app events that involved actually being pregnant --  
13 would those have been transmitted?

14 **A.** Not in this particular version that I'm showing you now on  
15 the screen.

16 **Q.** Okay. Do you have another version that we could look at?

17 **A.** Yes. So we have seen that --

18 **Q.** Can I just say we're on Slide 18, and it's referring to  
19 Exhibit 605 A here.

20 **A.** We have seen that at some point the Flo app incorporated a  
21 third option, "I am pregnant." That's the third option on the  
22 screen here.

23 And the parameter value associated with that is, in  
24 quotes, pregnant.

25 **Q.** Do you happen to remember the date that this got added or

1 the approximate date?

2 **A.** I think it was sometime in 2017, but I could be -- I could  
3 be wrong.

4 **Q.** Okay. So whatever date it actually was, and if we  
5 identify the date, fair to say that everybody who used the  
6 Flo app before that particular date, there would be no chance  
7 that a goal of -- or that saying "I'm pregnant" could ever have  
8 been transmitted in any code or in any way to any SDK provider  
9 by Flo; is that correct?

10 **A.** It's correct.

11 **Q.** Okay. Let's continue, then, with those next six custom  
12 app events that do relate to pregnancy.

13 Can you -- and remember yesterday I had that big board up  
14 and I kept trying to ask Dr. Egelman about the bottom four of  
15 those, and I kept trying to ask him what questions were even  
16 asked, let alone what answers were given with respect to the  
17 four pregnancy-related custom app events that are shown on  
18 Slide 19 as 3 -- as rows 3 through 6.

19 Do you remember that?

20 **A.** I do.

21 **Q.** And he said something like, oh, I couldn't remember, or he  
22 may have said it was in his logs or it might have been in his  
23 logs. I'm not trying to characterize what he said. But he  
24 certainly didn't answer the question; correct?

25 **A.** I don't remember his words either, but there was no answer

1 given.

2 Q. Okay. Have you reviewed his logs to see if there is an  
3 answer to that question anywhere?

4 A. I have.

5 Q. And what's the answer?

6 A. I'll show you the answer.

7 So out of these six events, I could not find four of them,  
8 the ones that I have crossed out in Dr. Egelman's logs.

9 Q. So with those four that you've got crossed out in red on  
10 what's now Slide 19, that's R\_PREGNANCY\_METHOD,  
11 R\_PREGNANCY\_METHOD\_DATE, R\_AGE\_CHOSEN\_PREGNANCY\_METHOD,  
12 R\_PREGNANCY\_WEEK\_CHOSEN\_UNKNOWN, for those, not only do you not  
13 have any inputs, but you also don't even have the questions  
14 that were supposedly asked back in the time period; correct?

15 A. That's correct, but in addition, I don't even have the  
16 outputs. I don't have the second part of the conversation, the  
17 supposed transmission from the Flo app to Meta that shows me  
18 that these custom app events were sent.

19 Q. And certainly -- you say you don't have it, but is there  
20 anything in -- anywhere in any of the materials Dr. Egelman  
21 produced that would give the answer to this?

22 A. I reviewed everything. I could not find the answer. And  
23 more importantly, I could not even find any instructions so I  
24 could do the analysis myself and figure out why they were  
25 missing.

1 Q. Okay. Finally, let's talk about this

2 SESSION\_CYCLE\_DAY\_FIRST\_LAUNCH. Can we go to that?

3 Can you explain what you're displaying here on Slide 20 in  
4 connection with this custom app event?

5 A. There is a lot, but I'm going to guide you through it  
6 slowly.

7 So we talked about this series of questions that users  
8 have to answer the first time they start the app. I call these  
9 user selections. This is my table on the left.

10 And the users answer four questions regarding -- it says  
11 date, but really it's the year of birth, last period, period  
12 length, and cycle length. And they can give different answers.

13 I want to call your attention to the second column, last  
14 period. Here you will see that in my testing, and I document  
15 that in my work, I selected "don't remember." This is an  
16 option.

17 There I can cite, where it says parameters, these are the  
18 transmissions to Meta.

19 So what is the lesson here? You look at this table and  
20 what you see is that the parameters, cycle day, cycle day type,  
21 and the corresponding values are different than anything that  
22 the user inputted in this particular example.

23 Moreover, I looked for evidence of this particular example  
24 in Dr. Egelman's logs to see if he tested something like that.  
25 Is the cycle day 0, is the cycle day type unknown, and I could

1 not find it.

2 Q. And I want to break down a few of the different things you  
3 said. But first, just to be clear, for  
4 SESSION\_CYCLE\_DAY\_FIRST\_LAUNCH, is there any evidence at all  
5 that Meta recorded any communication between Flo Health and its  
6 users or vice versa with respect to this custom app event?

7 A. Well, as I said, the Facebook SDK does not exist  
8 independently on the device and certainly doesn't record  
9 anything.

10 Q. Okay. But on this one in particular with respect to  
11 transmission, you talked about how the code was -- apparently  
12 that the Flo Health app entire code is written in a way that it  
13 could transmit certain information to Meta, like using those  
14 pre-addressed FedEx envelopes; right?

15 A. Right.

16 Q. And the code, whether or not it was designed to transmit  
17 information about SESSION\_CYCLE\_DAY\_FIRST\_LAUNCH, did you see  
18 anything in Dr. Egelman's work that showed that Meta actually  
19 received any information about this custom app event during the  
20 class period?

21 A. Transmission logs, by definition, contain a copy, let's  
22 say, of the contents of the envelope. It's not a receipt that  
23 the envelope was delivered, at least directly.

24 Q. Okay. And any Facebook records that show that you've seen  
25 that were able to be identified in this case that shows Egelman

1 actually received this information during the class period that  
2 you've seen?

3 **A.** Well, during the class period, no, because as we explained  
4 before, the data has been deleted during -- the data  
5 potentially during the class period has been deleted due to  
6 Meta's retention policies.

7 **Q.** What about the plus menu responses? And I think this is  
8 the last category.

9 That is are outside the 12 custom app events; correct?

10 **A.** Correct.

11 **Q.** And so what we have on the screen in Slide 21 is  
12 Exhibit 604I, which is a version of the app that Dr. Egelman  
13 showed sometimes where it has categories like lifestyle and sex  
14 and sex drive and how are you and log symptoms and has lots of  
15 different choices that the user could make; right?

16 **A.** Right.

17 **Q.** In all of Dr. Egelman's logs, did you ever see any  
18 communications --

19 Well, first of all, was Meta recording the -- anything  
20 about this, whether it was the questions or the answers?

21 **A.** You can ask me this multiple times and in multiple ways  
22 and my answer will be no, because the Facebook SDK does not  
23 exist independently on your device recording things.

24 **Q.** Okay. Was Flo in any way in any of these versions -- in  
25 this version trying to transmit any question or response of any

1 user to Meta, as far as you can tell by reading the code?

2 **A.** A response, definitely not. Question, I want to be more  
3 precise and I want to say that the way I interpret what I see  
4 on the right is they were transmitting an indication of whether  
5 the question was answered, not the specific answer to the  
6 question.

7 **Q.** Okay. But the one that was said by plaintiffs' counsel --  
8 I draw your attention to it during opening and there's been the  
9 subject of discussion, sex and sex drive. It's got options of  
10 didn't have sex, had protected sex, or had unprotected sex and  
11 several other options; right?

12 **A.** Right.

13 **Q.** And so by somebody answering that question, would you know  
14 anything about them, since they could have answered "didn't  
15 have sex" or "did have sex" or "did have unprotected sex" or  
16 anything else? Like just knowing the answer to the question,  
17 does that tell you anything at all?

18 **A.** Sorry. If you know the answer to the question -- to the  
19 question -- if I heard you right.

20 **Q.** I'm sorry. Just knowing that they answered but you don't  
21 know what they answered, would that tell you anything at all  
22 about that person?

23 **A.** Thank you for clarifying.

24 No.

25 **Q.** Okay. Now, Dr. Egelman said in a few times in response to

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1 my similar question to him: Hey, but there was an earlier  
2 version that only had two choices.

3 Remember he kept talking about that?

4 **A.** Yes. He explained that, yes.

5 **Q.** He claimed there was this earlier version, and for that  
6 one, I guess it had been designed so it would only show  
7 either -- you know, two kinds of sex or something like that,  
8 and he said: Well, that proves that maybe you could infer  
9 something.

10 Remember -- I'm, again, paraphrasing, but do you remember  
11 that line of discussion?

12 **A.** No. Dr. Egelman gave a very clear explanation of that. I  
13 remember very well.

14 **Q.** And we have --

15 **MR. CLUBOK:** Your Honor, I have an additional exhibit.  
16 We preadmitted this, but we added it at the end so it's not in  
17 your binder yet.

18 **THE COURT:** Okay. Is there any objection?

19 **MR. LEVIS:** No. Just like a copy of it.

20 **THE COURT:** Oh. All right.

21 Go ahead.

22 **MR. CLUBOK:** We're referring to Exhibit 603A.

23 Let's put up 603A.

24 **BY MR. CLUBOK:**

25 **Q.** So, sir, 603A is an earlier version -- well, you tell us.

1 What's 603A?

2 **A.** It is an earlier of the Flo app, and it's the one that  
3 Dr. Egelman was using to describe this example where just  
4 basically answering the question doesn't reveal whether you had  
5 protected or unprotected sex. It reveals logically whether you  
6 had sex.

7 **Q.** Right. And did you find -- this is an older version of  
8 the app that predated the one we were just looking at; correct?

9 **A.** It's quite a bit older.

10 **Q.** And was this version of the app available in all the  
11 materials you reviewed that Dr. Egelman had access to?

12 **A.** It's one of the so-called APK files. These are the app  
13 files that Dr. Egelman tested.

14 **Q.** And what's the date of Exhibit -- of the version of the  
15 Flo Health app that is reflected on Exhibit 603A?

16 **A.** This is a version from, if I recall correctly,  
17 October 2016.

18 **Q.** October 2016. In other words, the month before the class  
19 period started that's at issue in this case; correct?

20 **A.** I want to be a bit more careful. It could be  
21 October 30th, so up to a month. Okay?

22 **Q.** Sorry. It's a version that was dated in October, prior to  
23 the start of the class period on November 1st, 2016; correct?

24 **A.** I agree with that.

25 **Q.** Okay. And is there -- have you looked at all the other

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1 versions that were available to Dr. Egelman going forward in  
2 chronological order to see if after this, it changed?

3 **A.** Yes. A subsequent version and that -- I'm not sure if  
4 there were other versions in between, but a subsequent version  
5 nearby in November 2016 includes three options, the third  
6 option being -- I might be misremembering, but the substance is  
7 "I did not have sex."

8 **Q.** Well, let's put up Exhibit 1276, which has already been  
9 admitted. This is a version --

10 What's the date of this version, 1276?

11 **A.** Sometime in November 2016.

12 **Q.** And for the various Flo Health app versions, the next  
13 time -- or by November of 2016, they now have the three  
14 different versions, "didn't have sex," "protected sex," and  
15 "unprotected sex"; right?

16 **A.** That's right.

17 **Q.** Again, would any of the responses have even attempted to  
18 be transmitted by Flo pursuant to their source code?

19 **A.** Based on my review of the source code, no.

20 **Q.** And even if -- okay. Thank you.

21 Let's go back to your slides, and I think --

22 **MR. CLUBOK:** Next slide.

23 **BY MR. CLUBOK:**

24 **Q.** I think we're done now with responding to Dr. Egelman.

25 We're now going to ask you to briefly describe to us a --

1 maybe do whatever you have to do, but we'll try to make it as  
2 brief as possible. We're going to ask you to respond to  
3 Dr. Golbeck, who I understand the plaintiffs are going to be  
4 calling next week regarding the subject of machine learning.  
5 Okay?

6 **A.** Thank you. I will be brief, but I will try to convey the  
7 substance.

8 **Q.** Okay. And this is based on your review of her expert  
9 reports that she had to submit in this case. Obviously, you  
10 haven't seen her testify live yet; correct?

11 **A.** Her expert report and other materials that I reviewed.

12 **Q.** Okay. Based on that, what are your -- what's your review  
13 or analysis of what Dr. Golbeck, you understand, is intending  
14 to offer as opinions in this case?

15 **A.** I have two opinions that I offer with respect to  
16 Dr. Golbeck, 3A and 3B.

17 3A is that it is impossible to determine whether any app  
18 event data contributed to the performance of Facebook's ad  
19 delivery machine learning system.

20 **Q.** Can you explain that a little bit?

21 **A.** Of course. So Facebook shows you ads. They may use  
22 machine learning to do that and to show you relevant ads.

23 And Dr. Golbeck, one of the claims that I read in her work  
24 is that with near certainty, these custom app events that we're  
25 discussing somehow -- I don't know how, but somehow --

1 contributed and presumably improved the performance of  
2 Facebook's machine learning systems.

3 And it is impossible to determine that at least for the  
4 reason that the data, those custom app events data, doesn't  
5 exist, so I'm not sure how someone can say that without the  
6 data existing in this particular case.

7 Q. If you were peer-reviewing that opinion based on what she  
8 showed and the evidence or lack of evidence that she showed to  
9 support it, what would you say?

10 A. Well, I would politely ask did you maybe have some data to  
11 show me how this works, something along these lines.

12 Q. And did you see any such data or any evidence at all that  
13 Facebook actually used the custom app events data to target any  
14 ads?

15 A. As I said, that data doesn't exist anymore.

16 Q. Okay. How about the second point?

17 A. I'm going to read it for you. (as read):

18 "More data" -- and this is a broad point.

19 "More data does not equate to more powerful  
20 machine learning. Rather, more data might have no  
21 effect on the accuracy of your predictions and it  
22 might even make your predictions less accurate."

23 Q. Can you explain what you mean?

24 A. I will do my best.

25 This actually resembles a slide that I use in my class for

1 my MBA students. So bear with me for a few minutes. I'll be  
2 brief but to the point.

3 Suppose we have -- during my testimony we have been  
4 developing this hypothetical app, and maybe what our app  
5 does -- think of it like Instacart or some grocery app. Right?  
6 You can buy vegetables and fruits and detergent and whatever  
7 people buy.

8 And when you open an app, it makes you recommendations;  
9 right? Netflix tells you what movie to watch and the Whole  
10 Foods app tells me to buy more blueberries because that is what  
11 my kids eat. They make a recommendation. They don't show you  
12 a random thing.

13 Suppose that we want that make our own recommendations to  
14 our users. We want to get this right. How do we do that?

15 We have data. We all know that machine learning works  
16 with data.

17 What is the data? It's historical data from the past.  
18 Okay? What our users did on the app in the past.

19 What did they do? I will simplify it. This is a terrible  
20 grocery store. It only sells cereal and bottled water. Okay?  
21 We understand that. These are our products.

22 So we also collect two data points for our users. Let's  
23 say these are along the vertical axis, the number of -- we also  
24 sell vegetables. The number of vegetables they ordered and  
25 along the horizontal axis, the number of orders they placed in

1 the past. So maybe a user placed five orders in the past and  
2 the number of vegetables in every order was three.

3 I will take all my users from the past and put them on  
4 this little map, so people who ordered many vegetables and also  
5 had a lot of orders will be on the top right; few vegetables,  
6 few orders, the bottom left. You get the idea.

7 Now, we see a pattern emerge. People at the top who buy a  
8 lot of vegetables tend to buy water more often than cereal.  
9 People at the bottom who buy fewer vegetables buy more cereal  
10 and less water. And we are like: Aha. That's nice. That's a  
11 pattern we can use, right, to make recommendations.

12 But we don't stop here, because we're very excited about  
13 machine learning, and we say: Look, we're still making a  
14 couple of mistakes. This lady at the top left, we would  
15 recommend for her water, but she bought cereal; and this guy in  
16 the bottom right, he bought water, even though we would  
17 recommend cereal.

18 So we build a more complex machine learning model.

19 I want you to know one thing here. Previously I was only  
20 looking at the number of vegetables ordered to decide what to  
21 recommend. Now I'm going to also look at the number of orders,  
22 and I have this complex model that results in these two puzzle  
23 pieces.

24 How does that work?

25 **THE COURT:** Okay. We need to do a question-and-answer

1 format. This is just going on too long.

2 Ask a question.

3 **BY MR. CLUBOK:**

4 **Q.** Okay. Dr Zervas, what's shown in the slide on the right?

5 **A.** What's shown on the right is me now actually using my  
6 machine learning model in the real world.

7 **Q.** And how did you do that?

8 **A.** Now, a user arrives. I did not know what they're going to  
9 buy. I want to make a recommendation. Because in the past I  
10 know that they have few orders and they ordered few vegetables,  
11 on the red puzzle piece, I'm going to recommend cereal for  
12 them. Then I'm going to wait and I'm going to see what they  
13 bought. Maybe they bought cereal and I'm happy. I made the  
14 correct recommendation.

15 **Q.** Okay. And then what happens with the next customer that  
16 comes in?

17 **A.** Another customer comes in. Not to belabor the point, this  
18 customer is on the blue puzzle piece. I'm going to say because  
19 they ordered a lot of vegetables in the past and they placed a  
20 lot of orders, I'm going to recommend water. But they buy  
21 cereal, so I made the wrong prediction. I give myself an X.

22 **Q.** And then do you continue monitoring how the real world --

23 **A.** Then I continue. I continue. I make predictions. People  
24 buy things. And then if people are on the red puzzle piece and  
25 they bought cereal, it's correct; if they bought water, it's

1 wrong. And the other way around if they're on the blue puzzle  
2 piece.

3 I know this is a lot. One thing that I want you to  
4 remember: This is a complex model --

5 **THE COURT:** Can we just -- ask a question.

6 **MR. CLUBOK:** Yeah.

7 **BY MR. CLUBOK:**

8 **Q.** So what's the takeaway from this model where you started  
9 out with just number of vegetables ordered and you added some  
10 more data about the number of total orders to try to add more  
11 information on your machine learning? What's the takeaway when  
12 you compare the so-called training data to the real-world data?

13 **A.** I was doing a great job in the training data, but I do a  
14 very bad job in the real-world data. There's a lot of Xs.

15 **Q.** We've heard that phrase "Hindsight is 20/20" before. Is  
16 it possible to make a perfect fit in the training data if  
17 you're backwards, or backcasting?

18 **A.** Yes. You can make your model infinitely complex and  
19 explain everything in the past. That's very easy.

20 **Q.** So in other words, you can perfectly predict the past?

21 **A.** You can.

22 **Q.** If you have a model that perfectly predicts the past with  
23 dozens or hundreds or billions of data points, does that mean  
24 it's going to necessarily more perfectly predict the future?

25 **A.** We know, in fact, that it's going to be a terrible model

1 that very poorly predicts the future.

2 Q. And you have this phrase up here "overfitting." What does  
3 that mean?

4 A. Overfitting means I'm very good at predicting the past but  
5 I'm terrible at predicting the future. That's what it means.

6 Q. So is it the case that a company like Facebook, no matter  
7 how much data they get, even if it's about known and unknown or  
8 whatever else bits of data with the key or the code or without  
9 the key or without the code -- is it necessarily the case that  
10 more data is always good to improve the machine learning model?  
11 Yes or no?

12 A. No.

13 Q. And is this something you're certain about? Or I should  
14 say is this opinion something that you have a reasonable degree  
15 of certainty according to the standards of your profession?

16 A. I've been teaching this to my students -- I think it's the  
17 second or third lecture for the past seven years, and I have  
18 taught like more than 15 sections, 20 sections of machine  
19 learning. That's what I teach my students.

20 MR. CLUBOK: So let's go to the final slide -- oh, I'm  
21 sorry.

22 THE WITNESS: It's fine. We can skip that.

23 BY MR. CLUBOK:

24 Q. Is there anything more to show in Slide 24?

25 A. Sometimes simpler is better. That's what I wanted to tell

1     you.

2     **Q.**    So in other words, if you go back, actually, a slide, had  
3     this grocery store just tried to predict how much water people  
4     would buy based on the number of vegetables ordered as opposed  
5     to adding in data about how many times they made the order,  
6     they would have done a better job at predicting their next  
7     users; right?

8     **A.**    You said it better than I could.

9     **Q.**    By the way, all of this machine learning -- is this about  
10    developing a profile on the people who already did something or  
11    is it about predicting what new people might or might not be  
12    able to do?

13    **A.**    I want to be careful.  Sometimes you make predictions  
14    about your past customers, but frequently it's also the case  
15    that you want to make predictions for customers you have never  
16    seen before who are new to your app or your store.

17    **Q.**    And those are two different variations of how machine  
18    learning could apply in this circumstance; correct?

19    **A.**    Machine learning applies either way, but I'm generalizing.  
20    Most likely you would -- might do a bit better for people for  
21    whom you have some experience with rather than completely new  
22    customers.

23            **MR. CLUBOK:**  Can we go to the final slide.

24    **BY MR. CLUBOK:**

25    **Q.**    You've got your opinions up again, and I already asked

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1 with respect to Opinion 3, but I'll just ask, for completeness,  
2 Opinions 1 and 2.

3 In all of the opinions and all the things you've said to  
4 the jury today based on your expertise, were you giving those  
5 opinions to a reasonable degree of certainty according to the  
6 standards of your profession?

7 **A.** Yes.

8 **MR. CLUBOK:** Thank you.

9 And, Your Honor, I'd like to just mark Trial Exhibit 1275  
10 for demonstrative purposes, the slide deck that Mr. Zervas has  
11 used to assist in his testimony.

12 **THE COURT:** It's just a demonstrative, so you'll never  
13 see it again, but -- maybe in closing. But definitely a  
14 demonstrative.

15 **MR. CLUBOK:** Thank you.

16 **THE COURT:** Okay. Plaintiffs, cross-examination?

17 **MR. LEVIS:** Yeah.

18 **CROSS-EXAMINATION**

19 **BY MR. LEVIS:**

20 **Q.** Good afternoon, Dr. Zervas.

21 **A.** Good afternoon, Mr. Levis.

22 **Q.** I want to talk about some things you just testified about  
23 on direct.

24 Do you remember you talked about whether the Facebook SDK  
25 has control over -- or rather Facebook has control over the SDK

1 once it's included in the app?

2 Do you remember that?

3 A. Yes.

4 Q. And it was your testimony that after the SDK is made  
5 available, Facebook doesn't control what it does anymore?

6 A. Correct. Sorry. Let me be precise.

7 Q. Sure.

8 A. When it's incorporated in the app and it becomes a single  
9 cohesive set of compiled instructions published on the App  
10 Store and subsequently downloaded on the user to be operated on  
11 the devices, the Facebook SDK does not exist as a separate  
12 entity.

13 Q. The Facebook SDK, though, contacts Meta servers for  
14 configuration updates and other information, doesn't it?

15 A. Not that I know of.

16 Q. When it's installed in an app, it doesn't connect to Meta  
17 servers at all?

18 A. Of course it connects to Meta servers. I just testified  
19 that it transmits data to Meta servers to transmit data -- let  
20 me -- let me start from scratch.

21 You said it doesn't connect to Meta servers. Am I  
22 misrepresenting that?

23 Q. That's one thing I said.

24 A. Okay. It does connect to Meta servers. App developers  
25 use the SDK to transmit custom app events to Meta servers.

1 They instruct it to connect to Meta servers and send an  
2 envelope.

3 Q. We'll get to the envelope later.

4 Meta does have control of the SDK code before it is  
5 incorporated into the app, though; correct?

6 A. It has control over the source code.

7 Q. And it's created by Meta's engineers, that source code;  
8 correct?

9 A. I have to assume. We talked about that in my deposition.  
10 There might be. One nice thing about open source is that  
11 anyone can contribute. You know, maybe some user, some app  
12 developer found a bug or something. They suggested the  
13 solution. Meta adopted it. This would not likely, but  
14 obviously it stands to reason that the major contributor is  
15 Facebook.

16 Q. And they ultimately have control over whether they would  
17 accept those changes and the -- ultimately functionality in the  
18 SDK?

19 A. We discussed that as well. I did not review that  
20 specifically, but, again, it stands to reason that they would  
21 accept or reject changes.

22 Q. You had an opportunity to review the source code for the  
23 Flo app specifically; correct?

24 A. I had an opportunity to review the source code of  
25 different versions of the Flo app.

1 Q. And you didn't see any evidence that the Flo app modified  
2 the functionality of the Facebook SDK?

3 A. No, though -- and I'm sorry. I want to complete my  
4 answer.

5 The functionality of the SDK, as I explained, is meant to  
6 be tailored to app developers' needs. So different app  
7 developers might choose different app event names and different  
8 parameters, but they transmit with the help of the SDK to Meta.

9 Q. But as for the SDK core functionality itself, you didn't  
10 see any evidence that Flo developers modified that; correct?

11 A. I can make a precise statement. I have not seen any  
12 evidence that the open source code that is published and we  
13 know as the Facebook SDK was modified prior to being compiled  
14 into the Flo app.

15 Q. You -- the SDK is -- you don't dispute that the SDK is  
16 what transmits -- or strike that.

17 You don't dispute that the use of the SDK is what results  
18 in data being transmitted to Meta's servers, do you?

19 A. No, these are not the words that I would use. There is a  
20 simpler way to say that.

21 App developers use the SDK to transmit data to Meta as  
22 they desire.

23 Q. And when the data gets to Meta, Meta has control over what  
24 happens to that data; correct?

25 A. I think you would have to ask Meta. I can only tell you

1 broadly from my professional expertise that, yes, going back to  
2 the envelope, when you receive the envelope, you can read it.  
3 You can shred it. You can throw it away.

4 Q. Flo app users didn't have the option to delete that  
5 information from Meta's servers once it got there?

6 A. I want to make a more precise statement. I have not seen  
7 any evidence that they had this option. I don't want to  
8 preclude that this option might have existed. For instance, I  
9 have seen that many platforms, including Meta, offer users with  
10 the option to delete their data. This was not important for  
11 the opinions I offer in this case. So I want to make a  
12 slightly less absolute statement on how you posed it.

13 Q. But you didn't see any evidence of that here with your  
14 work in this case?

15 A. I think I could repeat my answer by this -- this is  
16 packing a lot, that this, in my case, is something specific.  
17 It could have existed. I haven't seen, you know, any user  
18 individually using that.

19 Q. You didn't see any evidence that the Flo app provided  
20 users with an ability to recall their data from Meta's servers,  
21 did you?

22 A. No.

23 Q. And you didn't see any evidence in the Flo app code itself  
24 that Flo app developers had attempted to recall the app data  
25 from Meta servers, did you?

1     **A.**    As I explained, it's exactly the opposite of what you're  
2     saying.  We see evidence of Flo app developers willingly using  
3     the SDK to transmit data.

4                 **MR. LEVIS:**  Can you pull up Slide 11 from Dr. Zervas'  
5     presentation, please.

6     **BY MR. LEVIS:**

7     **Q.**    Do you remember testifying about this during your direct  
8     examination?

9     **A.**    I do.

10    **Q.**    And this is a slide that shows an excerpt of the Facebook  
11    SDK code; correct?

12    **A.**    It shows an SDK from one file, I believe, in the  
13    Facebook SDK, but, yes, all the same.

14    **Q.**    If you look after the section that you have highlighted  
15    that ends with the word "applicable," do you see it says (as  
16    read):

17                 "Event names should be 40 characters or less,  
18                 alphanumeric, and can include spaces, underscores, or  
19                 hyphens, but must not have a space or hyphen as the  
20                 first character"?

21    **A.**    That's what it says.

22    **Q.**    Those are the requirements for an event name, according to  
23    this developer document; correct?

24    **A.**    Correct.  These are the technical requirements according  
25    to this documentation.

1 Q. An event name that meets those technical requirements  
2 would be sent by the Facebook SDK to Meta servers; correct?

3 A. I think we should stop saying that. It's incorrect. The  
4 Facebook SDK does not send anything.

5 Developers use the Facebook SDK to send app events data to  
6 Meta. And, yes, they have to follow the instructions provided  
7 in the Facebook SDK.

8 Q. We'll agree to disagree about that.

9 But for the technical requirements, you're not suggesting  
10 there's other requirements that need to be met for an event  
11 name for that event name to be transmitted to Meta servers;  
12 correct?

13 A. That's not what I said. Let's be precise again.

14 These are the technical requirements, I said, that I laid  
15 out here. There is also -- remember when I told you you have  
16 to download the SDK and you can also get it from Facebook? To  
17 actually get it from Facebook and incorporate it in your app as  
18 an app developer, you also have to agree to some terms and  
19 conditions.

20 So there could be additional limitations about the  
21 appropriate use of the Facebook SDK there.

22 Q. I'm not asking you about terms and conditions. I'm asking  
23 you just about technical requirements within the SDK.

24 And within the SDK code, the only technical requirements  
25 that an event name has to meet is these specific parameters;

1 correct?

2 **A.** No.

3 **Q.** Where are the other parameters?

4 **A.** In other documentation.

5 **Q.** And what are they?

6 **A.** One that I recall, for instance, is that -- and I'm not  
7 saying this applies to every version of the Facebook SDK.

8 For instance, if I recall correctly, no app can define  
9 more than 1,000 unique app event names. So it's fine to send  
10 the same thing again and again and again, but you cannot have  
11 more than 1,000 different things that you send.

12 **Q.** I think that's actually in the next sentence.

13 **A.** Ah, I'm so sorry.

14 **Q.** Okay. So other than not sending more than 1,000 event  
15 names and not having these character restrictions, there aren't  
16 any other technical requirements; correct?

17 **A.** I would be surprised if there aren't. I cannot cite a  
18 source right now, but in my own experience working with  
19 Internet transmissions, if, for instance, you start sending --  
20 imagine an app that sends an event every nanosecond. I have to  
21 guess that Facebook would block that because it would overwhelm  
22 the systems.

23 **Q.** There's not a technical requirement, though, that you  
24 can't include the word "pregnant" in an app event name;  
25 correct?

1    **A.**    I think, in fact, we have seen evidence to the contrary,  
2    that it was included.  It's a choice of the developer.

3    **Q.**    And there's not a technical requirement that you can't  
4    include the word "period" or "ovulation" or "cycle" in an app  
5    event name; correct?

6    **A.**    No.  We have seen evidence of the contrary.

7           **MR. LEVIS:**  Let's go to Slide 14, please.

8    **BY MR. LEVIS:**

9    **Q.**    I think this was your envelope analogy.  Do you remember  
10   this?

11   **A.**    I remember that.

12   **Q.**    And your analogy -- I think you said imagine you have an  
13   envelope, it's pre-addressed, and you wait to fill the envelope  
14   up before the envelope gets sent; right?

15   **A.**    I think I said before you send the envelope, but -- maybe  
16   not.

17   **Q.**    In your envelope example, when the envelope is full enough  
18   to be sent is determined by the Facebook SDK?

19   **A.**    Yes.  This is part of the convenience and reliability that  
20   is provided by SDKs.

21           I also talked about your battery draining, if you recall  
22   that.  So these SDKs -- a naive developer like me might do the  
23   following:  I want to generate an event.  I generate it, and  
24   then plop, I immediately send it.

25           That would not be very efficient.  The Facebook SDK has

1    been designed to be efficient for the user's device and  
2    presumably for Meta's servers.

3           So you group communications together and you put them in  
4    the envelope.

5    **Q.**   And Flo doesn't control those conditions about when the  
6    envelope gets sent?

7    **A.**   I -- I want to be, again, precise.  I feel like I recall  
8    reading that these conditions can be tuned.  I cannot say  
9    that -- I cannot cite the precise documentation right now.

10           However, what I can tell you -- and I know you asked me  
11   that before -- had they wanted to do that, because it is open  
12   source, they could simply tweak the code of the Facebook SDK  
13   and then incorporate the tweaked code into the app.

14   **Q.**   And you didn't see any evidence, though, that they did  
15   that?

16   **A.**   Correct.

17   **Q.**   The envelope is also pre-addressed with the address to  
18   Meta's servers, isn't it?

19   **A.**   Yes, I said that as part of the convenience and  
20   reliability that it provides.

21           **MR. CANTY:**  Let's see.  Let's go to Slide 17.  I just  
22   want to look at this for a minute.

23   **BY MR. CANTY:**

24   **Q.**   This was the survey screens that you testified about  
25   earlier.  Do you remember this?

1    **A.**    I do.

2    **Q.**    You're not disputing the values of these event names;  
3    correct?

4    **A.**    Disputing, no. I have seen them in logs and I have seen  
5    them in the source code, if that's what you mean by disputing.

6    **Q.**    And if we look at the R\_CHOOSE\_GOAL event, you're not  
7    disputing that the event "get pregnant" results from a user  
8    selecting "I want to get pregnant"; right?

9    **A.**    It's associated with the "I want to get pregnant" choice.  
10   I'm not disputing that based on my review of the source code.

11   **Q.**    And likewise, if a user -- you agree with me that if a  
12   user selects "I just want to track my cycle," that results in  
13   the event "track cycle"?

14   **A.**    When you say results, I think I spent almost too long  
15   explaining what results means. The app developer instructs,  
16   you know, the SDK to transmit the event R\_CHOOSE\_GOAL with a  
17   parameter TRACK\_CYCLE.

18   **Q.**    And that process, though, is -- follows or is associated  
19   with the selection of "I just want to track my cycle"?

20   **A.**    Chronologically, it follows, yes.

21   **Q.**    If a user doesn't select "I want to track my cycle," they  
22   do not get an event "track my cycle"?

23   **A.**    I did not do such an exhaustive investigation. There  
24   could be a bug or something. But, yes, I will agree with you  
25   that it seems that under normal operation, it's as you

described.

Q. And if we look at the next three screens, "When did your last period start," "On average, how long is your period," and "On average, how long is your cycle," your diagram indicates that there is an event there for "unknown."

Do you see that?

A. It's not -- I can see "unknown." I know what you're saying. I just, for the record, want to say that "unknown" is not an event. This has been a point of confusion in Dr. Egelman's reports as well. This is a parameter. The event is, for instance, R\_SELECT\_LAST\_PERIOD\_DATE.

Q. Okay. So for R\_SELECT\_LAST\_PERIOD\_DATE, that event name, there is a parameter of "unknown"; correct?

A. The parameter value is "unknown" or "known" depending on circumstances.

Q. And "unknown" is associated with the option above, "I don't know"; correct?

A. Correct.

Q. And for the next question, "On average, how long is your period," the value "unknown" is associated with "I don't know"?

A. Correct.

Q. And for the next one, "On average, how long is your cycle," the value "unknown" is also associated with "I don't know"; correct?

A. Correct.

1 Q. For the last slide here, "What year were you born," you  
2 have the parameter represented as CALCULATED\_NUMBER.

3 Do you see that?

4 A. I do.

5 Q. You omitted the actual parameter value?

6 A. Yes, because it depends on the current date. So if you  
7 read my slides a year from now, it would be inaccurate.

8 Q. You agree, though, that the calculated number is  
9 calculated based on the year selected in the screen above?

10 A. No. We should be more precise. It's calculated based on  
11 two things, the current year and the number selected above.

12 Q. Okay. So -- so the calculation is the current year minus  
13 the year selected above?

14 A. I agree with you, and I think I said that as well.

15 Q. So it results from the selection of the year on this  
16 screen?

17 A. I don't want to adopt your results from terminology  
18 because I did a lot of work to explain how things work, and I  
19 feel it wouldn't do -- it would be inaccurate just to say  
20 results.

21 There is a calculation. There are two inputs to the  
22 calculation. One is the current year; the other one is your  
23 choice -- and when I say "your," I mean the user of the app --  
24 on the screen.

25 We take the current year minus the choice. We compute 26

1 in this particular case. This is a calculation made by Flo app  
2 developers.

3 Flo app developers -- and I think I show that in the  
4 subsequent slides -- have also defined a custom app event name  
5 named R\_AGE\_CHOSEN\_PERIODS.

6 And the parameter value associated with that event would  
7 be this calculation that you and I talked about.

8 Q. You're not disputing, though, that the calculated number  
9 uses the user's choice to calculate that value?

10 A. When you say "this" and "that," it's a little bit -- I  
11 hesitate because I don't know what you mean by "this" and  
12 "that."

13 So -- and I'm sorry. I'm not -- I'm not blaming you for  
14 not giving me enough information. This is something that  
15 happens in the Flo app source code.

16 So what I can tell you with confidence is that we could  
17 open the Flo app source code and most likely find a line of  
18 code that takes 1999, figures out the current year, and does a  
19 subtraction. That, I can tell you.

20 Q. Okay.

21 MR. LEVIS: Go to Slide 18.

22 BY MR. LEVIS:

23 Q. So you were asked a number of questions on this slide  
24 about what happened when the "I'm pregnant" option was not  
25 available.

1 Do you recall that?

2 MR. CLUBOK: Objection. It was the previous slide  
3 that those questions were asked.

4 THE COURT: Your colleagues suggest there might be a  
5 prior slide. Do you want to use this one?

6 BY MR. LEVIS:

7 Q. You were asked a series of questions about whether Meta  
8 would have received information associated with answers to a  
9 question "I'm pregnant" during the period when the "I'm  
10 pregnant" option did not exist.

11 Do you recall those questions?

12 A. I don't think those were the questions, but we'll discuss  
13 the previous slide first. That had two options, and then  
14 I believe I explained in a later version of the app, Flo app  
15 developers added a third option, "I am pregnant," the third one  
16 on the screen, and the parameter value associated with that  
17 option is the new one that I introduced in this screen compared  
18 to the previous slide, the word "pregnant."

19 Q. And you were asked questions then about whether Meta would  
20 receive information reflecting an R\_CHOOSE\_GOAL of pregnant  
21 prior to this version with three options existing.

22 Do you remember that?

23 A. I'm struggling when you say you were asked questions,  
24 because I was asked many questions. Is there a specific  
25 question that you would like to discuss again?

1 Q. Let me clarify.

2 You're not suggesting that once the "I'm pregnant" option  
3 existed that Meta would not receive R\_CHOOSE\_GOAL with a  
4 parameter of "pregnant," are you?

5 A. Can you point me to the "unpregnant" option?

6 Q. "I'm pregnant" is the --

7 A. I'm so sorry. That's my fault. I heard "unpregnant."

8 The "I'm pregnant" option existed. When three options  
9 exist, users can make one of three choices -- or, of course,  
10 they can exit the app altogether.

11 But assuming they make a choice, they would select one of  
12 the three, and the parameter values associated with these three  
13 choices, at least below on my slide, they are "get pregnant,"  
14 "track cycle," and "pregnant."

15 Q. And so for users who selected "I'm pregnant," those -- the  
16 event name R\_CHOOSE\_GOAL with the parameter "pregnant" would be  
17 transmitted to Meta?

18 A. The app, as programmed by Flo app developers, would  
19 attempt to transmit exactly what you said, the R\_CHOOSE\_GOAL  
20 event name together with the parameter value "pregnant,"  
21 assuming the user clicked "I am pregnant."

22 MR. LEVIS: Let's go to Slide 20.

23 BY MR. LEVIS:

24 Q. This is a slide you discussed that reflects your testing  
25 related to SESSION\_CYCLE\_DAY\_FIRST\_LAUNCH; correct?

1     **A.**    Correct.

2     **Q.**    And this is a -- there are two charts here.  The one on  
3   the left, user selections, that reflects your answers in the  
4   onboarding survey; correct?

5     **A.**    Correct.

6     **Q.**    And the one on the right reflects the parameters that you  
7   observed as a result of these selections; correct?

8     **A.**    Both the parameters and the corresponding values.

9     **Q.**    Okay.  In this chart, on the -- for the question "last  
10  period," which corresponds to "What was the day of your last  
11  period," you answered "don't remember" in every one of your  
12  examples; correct?

13    **A.**    Correct.

14    **Q.**    And you didn't test a version of this where you put  
15  different answers in for your last period?

16    **A.**    I did.  I'm just not showing it in this slide.

17    **Q.**    Where is this data?

18    **A.**    What do you mean?  It's not on the slide.

19    **Q.**    Yeah, it's not on your slide.  Where is your column  
20  showing the output for a version of this chart that does not  
21  only select "don't remember"?

22    **A.**    I didn't claim this on my slide.  You asked me if I tested  
23  different options, and I said, yes, I did.

24    **Q.**    So you're not disputing, then, that if you select a date  
25  for your last period, for instance, you will get different

1 parameter values that are other -- something other than 0 or  
2 "unknown"?

3 **A.** I don't dispute that. In fact, I stated that Dr. Egelman  
4 omitted to discuss these parameters -- sorry -- these user  
5 selections and the associated parameters. That's why I  
6 presented this, to fill a gap. I'm not saying these are the  
7 only parameters and the only user selections, just to be clear.

8 **Q.** And you're not otherwise disputing that the values in  
9 Dr. Egelman's logs associated with the

10 SESSION\_CYCLE\_DAY\_FIRST\_LAUNCH are correct?

11 **A.** I wish I had a way to check, but I have been asking for  
12 the notes for a while. There is zero replication instructions.

13 Frankly, without notes, I don't know if -- you know, I  
14 should not speak for Dr. Egelman. But sometimes if it's been a  
15 few years since I've done something and I don't have notes,  
16 even I cannot go back and recreate my work, let alone someone  
17 else's.

18 Part of what I'm showing you here is clear instructions on  
19 how to replicate my work, and I provide a lot more instructions  
20 in my report. I have, I think, a 10-page appendix or how to  
21 set up my testing methodology, what selections I made, and what  
22 parameters were transmitted.

23 **Q.** And you personally, though, observed different parameter  
24 values for CYCLE\_DAY and CYCLE\_DAY\_TYPE in your own testing  
25 different from the 0 and unknown reflected here; correct?

1   **A.**    Correct.  And I even have a screenshot in my report where  
2   I explained that CYCLE\_DAY\_TYPE, for instance, is the result of  
3   a pretty long and complicated calculation performed by Flo app  
4   developers.

5   **Q.**    And the inputs to that calculation are the answers to the  
6   survey questions?

7   **A.**    I want to be careful here.  Yes, to the substance of your  
8   question.

9           No -- and I'm being a bit of a stickler.  I don't know  
10   that it's going to use necessarily every single user selection.  
11   I have a doubt, for instance, as to the year of birth and as to  
12   whether this even matters for cycle date.  But I'm not sure.

13   **Q.**    But as to -- at least as to these three, last period,  
14   period length, and cycle length, you agree that those would be  
15   the inputs to that calculation?

16   **A.**    To the best of my recollection of the source code, this  
17   would be used for the calculation.

18           **MR. CANTY:**  Can we go back to Slide 19, please.

19   **BY MR. CANTY:**

20   **Q.**    You mentioned earlier that you looked at Dr. Egelman's  
21   logs and you would unable to find these four specific events.

22           Do you recall that?

23   **A.**    Correct.

24   **Q.**    Okay.  And they were R\_PREGNANCY\_METHOD,  
25   R\_PREGNANCY\_METHOD\_DATE, R\_AGE\_CHOSEN\_PREGNANCY\_METHOD, and

1 R\_PREGNANCY\_WEEK\_CHOSEN\_UNKNOWN; right?

2 A. Correct.

3 Q. Okay. You're aware, though, that these events were  
4 received by Meta; correct?

5 A. Two different statements. I don't know what you're  
6 referencing here exactly, what document you're referencing.

7 I made a completely different statement here. I said  
8 precisely that these events -- it's on the title -- are not  
9 contained in Dr. Egelman's logs.

10 Once again, this is what Dr. Egelman attempted to send.  
11 It doesn't speak as to what Meta necessarily received.

12 Q. And I'm trying to understand what your opinion is now.

13 You're not contesting whether these were received, are  
14 you?

15 A. They were definitely not received in Dr. Egelman's testing  
16 because nothing can be received if it's not sent.

17 Q. Well, it's a different question.

18 I'm asking you if your opinion now is that these events  
19 were not received by Meta during the class period.

20 A. We have to be a bit more precise. What events? For  
21 instance, for the plaintiffs? For some user? For whom?

22 These events are just names. These are not received.  
23 These are just strings in the code that exist. They sit there  
24 quietly until someone uses them.

25 So when you say they were received, I want to understand

## PROCEEDINGS

1 in what particular circumstance. The specific -- and I'm  
2 making a narrow statement. The specific circumstance I have in  
3 mind is Dr. Egelman's logs.

4 **MR. LEVIS:** Can we switch the screen so we can show an  
5 exhibit just to the witness and not the jury?

6 Can you pull up Trial Exhibit 110 and display it.

7 (Pause in proceedings.)

8 **THE COURT:** Okay. We're going to take our afternoon  
9 break. The witness will be on the stand when you get back. If  
10 you have any more questions, this would be a fine time to write  
11 them down, but I'm certainly not soliciting or encouraging you.  
12 It's up to you.

13 **THE COURTROOM DEPUTY:** All rise.

14 **THE COURT:** For you, 1:25.

15 (The jury leaves the courtroom.)

16 (Proceedings were heard out of the presence of the jury.)

17 (Recess taken at 12:58 p.m.)

18 (Proceedings resumed at 1:21 p.m.)

19 (Proceedings were heard out of the presence of the jury.)

20 **THE COURTROOM DEPUTY:** Please remain seated. Come to  
21 order. We're back on the record in Civil 21-757, Frasco versus  
22 Flo Health, Inc.

23 **MR. CLUBOK:** Your Honor, may I raise one question? If  
24 it can't work, it can't work.

25 But the next witness has a preplanned family vacation next

## PROCEEDINGS

1 week. We're hopeful he can get done.

2 THE COURTROOM DEPUTY: You can't drink in here.

3 THE COURT: No, liquids in the courtroom in the  
4 gallery.

5 What's the question?

6 MR. CLUBOK: I'm sorry, Your Honor.

7 The next witness has a preplanned family trip. If it's  
8 possible to stay late and finish him, we'd ask if that's okay.  
9 If it's not, we'll do the best we can.

10 THE COURT: Who is it?

11 MR. CLUBOK: Mr. Satterfield.

12 THE COURT: What's the time estimate? Are you  
13 doing --

14 MR. CANTY: I'm calling --

15 THE COURT: Adverse witness?

16 MR. CANTY: Yes.

17 THE COURT: How long will you need?

18 MR. CANTY: Roughly 40 minutes.

19 THE COURT: Okay. And cross -- or redirect, I should  
20 say?

21 MR. CLUBOK: I'm hearing 30 to 40.

22 THE COURT: Okay. Is he next?

23 MR. CANTY: Yes, Your Honor.

24 THE COURT: We should be fine.

25 Okay. Here are the questions from the jury.

## PROCEEDINGS

1       Would you put up the demonstratives for the witness and go  
2 to Slide 12, please.

3           **THE COURTROOM DEPUTY:** What side is putting it up?

4           **THE COURT:** Yes, okay. Good.

5       Here is the question.

6       I'm assuming -- I think this is the right slide, but...

7           "Question: What is the name of the code  
8 language on Dr. Zervas' slide? Is the code the same  
9 coding language that Flo app developers used during  
10 the class period to create both the iOS and Android  
11 versions of the Flo app?"

12       Seems like a perfectly fine question, so I'm going to ask  
13 that.

14       And Question Number 2 is a two-part question.

15           "Part 1: Did you see" --this is directed to the  
16 witness, of course.

17           "Did you see SDK provide option for developers  
18 to de-ID before transmitting data to Meta?"

19       And part 2 is:

20           "Have you seen Flo try to de-ID before  
21 transmitting data to Meta?"

22       Both fine questions, so I'll ask both. Let's bring the  
23 jury in.

24       Are you going to do any redirect?

25           **MR. CLUBOK:** Right now, maybe one question.

## ZERVAS - CROSS / LEVIS

1           **THE COURT:** All right. I'll ask these questions when  
2 you're done.

3           **MR. SADUN:** Your Honor, before the jury comes in, just  
4 housekeeping. Can we mark the Karkanias deck as  
5 Trial Exhibit 1276?

6           **THE COURT:** You want to do what?

7           **MR. SADUN:** Mark the presentation used with  
8 Mr. Karkanias as Trial Exhibit 1276, the next in line.

9           **THE COURTROOM DEPUTY:** There's already an  
10 Exhibit 1276.

11           **MR. SADUN:** Okay. 77.

12           **THE COURT:** Later.

13 Okay. Bring them in.

14                   (The jury enters the courtroom.)

15                   (Proceedings were heard in the presence of the jury.)

16           **THE COURTROOM DEPUTY:** You may be seated.

17           We're back on the record in Civil 21-757, Frasco versus  
18 Flo Health.

19           **THE COURT:** Okay. You may continue.

20           **MR. LEVIS:** Okay. If we can put back the last slide  
21 we were on, which I believe is Slide 19.

22                   **CROSS-EXAMINATION**

23           **BY MR. LEVIS:**

24           **Q.** Okay. You recall before the break we were talking about  
25 these events?

## ZERVAS - CROSS / LEVIS

1     **A.**    I do.

2     **Q.**    And we were talking about whether these events were  
3   transmitted to Meta during the class period.

4           Do you recall that?

5     **A.**    I do.

6     **Q.**    And I asked whether you were intending that these events  
7   were not transmitted to Meta during the class period.

8           Do you recall that?

9     **A.**    I recall --

10           **THE COURT:** Do we have the screens on? I don't think  
11 their screens are on.

12           **MR. LEVIS:** Sorry.

13           **THE COURT:** Yes? Do you see something?

14           Okay. Go ahead.

15     **BY MR. LEVIS:**

16     **Q.**    Okay. You submitted an expert report in this case;  
17 correct?

18     **A.**    More than one.

19     **Q.**    And you testified earlier about the sources of documents  
20 that you relied on in connection with those reports; correct?

21     **A.**    Correct.

22           **MR. LEVIS:** If we could switch the screen off so we  
23 can show a document to Dr. Zervas only and not the jury.

24           Oh, I can actually do a hard copy.

25           **THE COURT:** Are your screens off?

## ZERVAS - CROSS / LEVIS

1           **MR. LEVIS:** We discussed this previously. I'm just  
2 going to show the witness a hard copy since it's easier.

3           **THE COURT:** Okay. That's fine.

4           **THE WITNESS:** Thank you.

5           **MR. LEVIS:** You're welcome.

6           **THE COURT:** How about one for the old judge?

7           **MR. LEVIS:** Yep, I have them.

8           **THE COURT:** Okay.

9           Thank you. All right.

10          **BY MR. LEVIS:**

11          **Q.** I'm handing you a copy of what is an excerpt from  
12 Trial Exhibit 110. This is a roughly 70,000-line spreadsheet  
13 that you reviewed in connection with your expert report in this  
14 case and was cited in your affirmative report on Footnote 2.

15           If you take a look at this document, please, you will  
16 see --

17           **MR. LEVIS:** And we can leave the actual previous slide  
18 up that we had before, Slide 19, for the jury if that's okay.

19          **BY MR. LEVIS:**

20          **Q.** I want you to take a look at this, because several of the  
21 app names you crossed out are present on this sheet; correct?

22           Can you take a look?

23          **A.** They are.

24          **Q.** Okay. If you look, you'll see the first app ID you  
25 crossed out was R\_PREGNANCY\_METHOD, and if we look at this

1 spreadsheet, you'll see there is -- R\_PREGNANCY\_METHOD is at  
2 row 157; correct?

3 A. Correct.

4 Q. Okay. And this document, it's titled on the top of the  
5 page "A summary of app events sent from the Flo Health app to  
6 Facebook, December 9th, 2017, through December 4th, 2019."

7 Is that correct?

8 A. That's correct.

9 Q. Okay. And this is a document that was created from Meta's  
10 own data; correct?

11 A. That's how I interpret this document.

12 Q. Okay. And that first event, R\_PREGNANCY\_METHOD, that's  
13 present here on row 157 of that sheet; correct?

14 A. Correct.

15 Q. Okay. And the third column here indicates that that event  
16 was associated with approximately 423,000 unique individuals on  
17 Meta's systems; correct?

18 A. Correct.

19 Q. Okay. The next line you crossed out was  
20 R\_PREGNANCY\_METHOD\_DATE; correct?

21 A. Correct.

22 Q. Okay. And if you look up on this, this spreadsheet, you  
23 have R\_PREGNANCY\_METHOD\_DATE in row 158; correct?

24 A. Correct.

25 Q. And this spreadsheet indicates that that information was

## ZERVAS - CROSS / LEVIS

1 associated with 397,549 unique individuals on Meta's servers;  
2 correct?

3 A. Correct.

4 Q. The next one you crossed out  
5 R\_AGE\_CHOSEN\_PREGNANCY\_METHOD. That appears at row 146 on this  
6 spreadsheet; correct?

7 A. Correct.

8 Q. Okay. And this indicates that that event was associated  
9 with 391,917 unique individuals; correct?

10 A. Correct.

11 Q. And the last one you crossed out,  
12 R\_PREGNANCY\_WEEK\_CHOSEN\_UNKNOWN, that's the last row on this  
13 spreadsheet; correct?

14 A. Correct.

15 Q. And that indicates that this event was associated with  
16 444,244 unique individuals; correct?

17 A. Correct. I don't think I -- did you say I crossed it out  
18 on the spreadsheet? No, on the screen.

19 Q. On the screen?

20 A. Sorry. Yes, I agree with everything you said, yes.

21 MR. LEVIS: We can take this screen down.

22 BY MR. LEVIS:

23 Q. I want to talk about the additional exhibit. I don't know  
24 if we have this available to put on the screen for the jury,  
25 but it was the one that was handed out with the two options of

1 either "protected" or "unprotected sex." You have a copy of  
2 it.

3 Do you remember being asked about this before?

4 **A.** Sorry. Do I have -- have I been asked about what?

5 **Q.** Do you remember being asked about this earlier today?

6 **A.** Yes. I was asked by counsel there.

7 **Q.** Okay. And I think you testified that this -- the app  
8 version with this particular screen was -- was released about a  
9 month before the start of the class period; correct?

10 **A.** I think I -- I think I said October 2016.

11 **Q.** I thought you testified earlier it was October 2017.

12 **A.** No.

13 **Q.** The -- when users download apps, you're not required to  
14 update an app immediately when a new version comes out;  
15 correct?

16 **A.** Yes and no. They're not required. What happens -- this  
17 is an experience we all have. We don't go in and manually  
18 update apps; they get updated on our phone sometimes  
19 automatically.

20 It can also be the case that if an app is not updated,  
21 then it might stop functioning because it cannot talk to  
22 servers or other components.

23 **Q.** Users that installed the app in October of 2016, for  
24 example, could still have been using that app a month later, in  
25 November 2016; correct?

1   **A.**   It is plausible. But at least on my phone, my experience  
2   is that apps get updated in an interval that's more frequent  
3   than once a month.

4   **Q.**   You had have to enable automatic updates for that to  
5   happen automatically, though; correct?

6   **A.**   No. At least on any device that I have used, the default  
7   option is automatic updates. So I think -- I understand what  
8   you're saying.

9        I think it would be more accurate to say to not receive  
10   automatic updates, you would have to go and disable automatic  
11   updates, to the extent that this is possible.

12   **Q.**   So it's possible, then, that there are users who were  
13   still using this version of the Flo app within the class period  
14   a month later?

15   **A.**   It's theoretically possible, though it's important to note  
16   how did they make this determination that there were two  
17   options and then three?

18        I looked for subsequent versions that had more options.  
19   The next version released sometime in November 2016 already had  
20   the option don't -- I forget what it was, but the third option,  
21   "I don't know" or "I don't remember."

22        Okay?

23   **Q.**   And you don't know if that last -- the new version that  
24   added a third option was after the start of the class period or  
25   not, do you?

1    **A.**    I believe the class period starts November 1st?  Correct  
2    me if I'm wrong.

3    **Q.**    Yes.

4    **A.**    All I know is the month, so...

5    **Q.**    So it would have been released within the class period?

6    **A.**    Within the very, very start of the class period,  
7    I believe, yes.

8    **Q.**    You offered some testimony about machine learning earlier  
9    today.  Do you recall that?

10   **A.**    I did.

11   **Q.**    And you've never worked at Meta; right?

12   **A.**    I never worked at Meta.  That's right.

13   **Q.**    And despite being hired as an expert by Meta, you did not  
14   inspect their actual machine learning systems as part of your  
15   analysis here; correct?

16   **A.**    Yes, but the "despite" -- to the extent that you mean that  
17   I needed to do that or I asked and I was not allowed -- sorry.  
18   I don't want to put words in your mouth.

19        The answer is yes, because I didn't need to.

20   **Q.**    And you didn't -- you didn't go to Meta and look at the  
21   code running on their machine learning systems; correct?

22   **A.**    No, because it was not necessary for me to offer the  
23   opinions that I offered in this case.  These are basic machine  
24   learning principles that I think -- I hope that I conveyed with  
25   my slides.

1 Q. Yeah, I just want to make sure that we're all clear that  
2 you didn't actually review the specific systems that would have  
3 processed data that Meta received from the Flo app during the  
4 class period; correct?

5 A. Yes, but you pack a lot in this question. So I don't know  
6 what systems received what because, as we established, I did  
7 not work at Meta. That's true.

8 What I want to explain is that the reason I described  
9 these things in a high level and not specific to Meta is  
10 because these principles apply to any machine learning model,  
11 including Meta's. The actual code and how it's implemented,  
12 this is the software development.

13 You remember how I told you that in my class I teach both  
14 theory and software development? That was theory. It applies  
15 to everything.

16 Q. But I guess the finer point is you didn't go look at  
17 Meta's systems to determine what they applied from that theory  
18 you're talking about?

19 A. I -- I'm really sorry. I don't agree with that. I think  
20 what I said -- in fact, the finer point is that it doesn't  
21 matter, because the finer point that I'm trying to make is that  
22 this is a universal principle in machine learning. That's the  
23 finer point.

24 Q. So your testimony is that you don't think it matters  
25 whether or not you reviewed Meta's systems or not?

1   **A.**   These are not my words.  I know what you're saying.

2           It doesn't matter with respect to that basic foundational  
3 machine learning principle.  Meta and anyone else is subject to  
4 overfitting.  This is a machine learning principle that I teach  
5 my students.  It doesn't vary for Meta, for Google, for me, or  
6 for you.

7   **Q.**   Sure.  But as part of your analysis, you didn't actually  
8 send any data from the Flo app to Meta and then look at how  
9 that data was processed once they received it; correct?

10   **A.**   Yes and no.  So I did do some testing.  I created some  
11 transmission logs.  These were sent to Meta.

12           I cannot tell for sure that they were received, though I  
13 did not observe any errors.  And certainly I -- just from these  
14 logs alone I cannot determine how they might have been used.

15   **Q.**   And you didn't take data from the class period and run it  
16 through Meta's machine learning systems to determine how they  
17 used that information?

18   **A.**   Oh.  So let's take a step back.

19           I think I mentioned that data from the class period has  
20 been deleted subject to Meta's retention policies.

21           But let's say it was available.  I don't know what you  
22 mean "run it through the systems."  That part is not very clear  
23 to me.

24   **Q.**   You didn't test what happened after that information got  
25 there?

1     **A.**    That -- I'm really sorry.  I misheard the last word.

2     **Q.**    You didn't test what happened after that Flo app data  
3     reached Meta's servers?

4     **A.**    The Flo app, as coded by developers, based on my work in  
5     this case, created custom app events, associated parameter  
6     values, and transmitted those custom app event names and those  
7     values to Meta.

8            I have recorded these things in my transmission logs and I  
9     provide application instructions.

10           For the opinions that I offer in this case, it was not  
11    necessary for me to go see what happened to the data so that I  
12    can tell you about overfitting, for instance.  The finer point  
13    we were discussing before is one of the foundational machine  
14    learning principles rather than the idiosyncratic use of data  
15    by any machine learning engineer.

16    **Q.**    Let's look at the slide you had here.  I think it's  
17    Slide 23.

18           **MR. LEVIS:**  If we can put that up.

19    **BY MR. LEVIS:**

20    **Q.**    I think this is what you were talking about, overfitting?

21    **A.**    Correct.

22    **Q.**    And I guess in this example there's two types of data  
23    here.  There's vegetable -- vegetables ordered and orders;  
24    right?

25    **A.**    Correct.

1 Q. And I'm not going to walk through your whole explanation  
2 again, but I think you went on to say that you could use this  
3 data to create a model that in the real world can result in  
4 predictions that might be inaccurate?

5 A. Again, a slightly finer point. Every machine learning  
6 model will make inaccurate predictions. What I was trying to  
7 explain -- and maybe it didn't come across -- is that this more  
8 complex model with the more complicated puzzle pieces might  
9 make less accurate predictions than --

10 I cannot control my slides. Would you mind sharing the  
11 subsequent slide?

12 Q. 24? Sure.

13 A. Thank you so much.

14 It might make less accurate predictions than the simpler  
15 model, which only relies on vegetables ordered and not number  
16 of orders. So you can see here how does the simple model work.  
17 It says: If you order many vegetables, recommend water. If  
18 you order few vegetables, recommend cereal.

19 That was the point.

20 Q. In your example, though, regardless of whether the  
21 predictions are right, you still use the number of vegetables  
22 ordered and the number of orders to derive those predictions;  
23 correct?

24 A. Literally not. You can delete number of orders. You can  
25 just as -- I will say the word "project." What do I mean?

1 Imagine you take all these people and you just, whoop, move  
2 them on the vertical axis. All you have to do is look above  
3 the number 10 or below the number 10 to make your prediction.  
4 This number of orders is literally ignored.

5 **Q.** Right, and maybe that's confusing on my part.

6 The one on the right is your simpler version that uses one  
7 data point; right?

8 **A.** It uses -- I see what you're saying. It uses one feature.  
9 Many data points, one feature. But we agree.

10 **Q.** Okay. So -- and the one on the right, you're asking one  
11 feature? You're using the number of orders to determine the --  
12 the value?

13 **A.** I know it's confusing because it's horizontal.

14 No, I'm asking the number of vegetables ordered.

15 **Q.** Okay. So on the one on the right, you're using the number  
16 of vegetables ordered to make these predictions?

17 **A.** Yes, and if it's above 10, I say let's show them water --  
18 "them" being our customers.

19 If it's below 10, let's show them cereal.

20 **Q.** Okay. Go back to 23.

21 In this one, in the slide on the right, you're using both  
22 the number of vegetables and the number of orders?

23 **A.** Exactly.

24 **Q.** And regardless of whether the predictions are correct or  
25 not, you still use both features of that data?

## ZERVAS - CROSS / LEVIS

1 A. Correct. For every new customer that arrives at my app, I  
2 say how many vegetables have they ordered, how many orders, and  
3 then I locate them on this two-dimensional plane like a  
4 chessboard. If they land on the red puzzle piece, I recommend  
5 cereal. If they land on the blue puzzle piece, I recommend  
6 water. And I don't -- actually, I make quite a few mistakes.

7 Q. You're retained in this case by both Meta and Flo;  
8 correct?

9 A. For the later part of this case. Correct.

10 Q. And you're being compensated for your time?

11 A. I am.

12 Q. How much are you being paid?

13 A. Per hour or total?

14 Q. Per hour first.

15 A. The highest rate has been \$950. I believe the lowest  
16 was -- per hour. The lowest was 800 per hour.

17 Q. And how much have you been compensated so far in total?

18 A. I looked at that recently. It's approximately -- I think  
19 it's over, actually, 200 hours. Let's take the highest rate.  
20 My best guess now would be \$200,000, maybe a bit more.

21 Q. And when was the last time you calculated that?

22 A. Recently, because I send invoices usually at the beginning  
23 of every month. So the number I'm telling you now doesn't  
24 include work done this month.

25 Q. This isn't the first time you've testified on behalf of

1 Meta, is it?

2 A. Including depositions? No. It's my first time in trial.

3 Q. You've been retained by Meta to -- as an expert in several  
4 other cases; correct?

5 A. Correct.

6 Q. And you've testified for them in several other depositions  
7 in several other cases; correct?

8 A. I list those as appendices to, I think, all of my reports,  
9 yes.

10 Q. And just to make sure that we're current, how many matters  
11 have you testified as an expert for Meta?

12 A. I would have to -- if you can show me my report, I can  
13 count, but it must be a handful. It must be --

14 I list those in my report. I would hesitate to guess.

15 Q. You don't know how many times you've been retained?

16 A. You asked me a different question, how many times I've  
17 testified.

18 How many times I was retained? I recall very well that at  
19 the time of -- you took my deposition, I think together we  
20 counted five matters.

21 I just also recall very well that at least for two of  
22 these matters, I gave no testimony and I filed no report.

23 For the other three matters, I think I have been deposed,  
24 but I don't recall perfectly. Once again, all these details  
25 are in my report.

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1 Q. Your deposition in this case the last time was about a  
2 year ago, wasn't it?

3 A. It was 2024. Correct. It was summer.

4 Q. Have you been retained by Meta any additional times since  
5 that deposition?

6 A. No, I have not signed any engagement letters for further  
7 cases with Meta.

8 Q. You've testified for other big tech companies too, haven't  
9 you?

10 A. I assume you have Google in mind.

11 Q. I exactly have Google in mind. How many times have you  
12 testified on behalf of Google?

13 A. That -- to be honest, I don't remember, but -- just  
14 precisely, but I can estimate, but it's -- you know, roughly  
15 equal, I would say.

16 Q. And how -- just so I'm clear, how many times have you been  
17 retained by Google as an expert?

18 A. I don't have that number handy for you. Again, that would  
19 be -- so the appendices of my report list all my prior  
20 testimony, including for Google and other companies that I do  
21 work for.

22 Sitting here right now, I can tell you that it's probably  
23 the same -- on the same order of magnitude as Meta.

24 Q. You remember I asked you previously about how much of your  
25 revenue came from testifying for companies like Meta and

## ZERVAS - REDIRECT / CLUBOK

1 Google; correct?

2 A. I call it my income, but sure.

3 Q. And you actually testify for Meta and Google so frequently  
4 that as of the first time you were deposed in 2023, a majority  
5 of your consulting income came from them; correct?

6 A. I'm sure that was right in 2023, but I have to tell you,  
7 this work is very bursty. It happens -- nothing happens for a  
8 long time, and then a lot happens in a short period of time.

9 So, for instance, I was recently looking at my invoices  
10 for this year, and this year -- now it's July, so we're past  
11 half the year, and I would say maybe 20 percent of my income is  
12 from this type of consulting, not just Meta or Google, but  
13 other clients as well. So it varies year by year.

14 Q. But at the time you were deposed, it was a majority of  
15 your income?

16 A. Yes. I -- in 2023, I recall being busy, so I wouldn't be  
17 surprised to find out that it was more than 50 percent.

18 MR. LEVIS: Nothing further.

19 THE COURT: Okay. Any brief redirect?

20 REDIRECT EXAMINATION

21 BY MR. CLUBOK:

22 Q. Sir, you just testified about getting paid, and I think  
23 you were asked first about the majority of your consulting  
24 income versus -- and the question changed -- talking about your  
25 income as a whole.

## ZERVAS - REDIRECT / CLUBOK

1 Just to be clear, in the last year, what's your total  
2 income from consulting on behalf of anyone, roughly?

3 A. Roughly, I would say what I have been paid is  
4 approximately \$50,000?

5 Q. And --

6 A. I'm sorry. In the past year -- do you mean in the current  
7 year? Because that's what I'm referring to.

8 Q. Sure. That's fine.

9 A. In the current year.

10 Q. When you do consulting, do you do it for plaintiffs as  
11 well as defendants?

12 A. Yes. I have done it for plaintiffs too.

13 Q. And you've testified for them truthfully as well?

14 A. Yes, I. Want to be truthful and correct and explain  
15 things.

16 Q. Has anyone from Meta or from my law firm or any other law  
17 firm you've worked with ever asked you to be an advocate as  
18 opposed to an expert for our -- the company?

19 A. Never.

20 Q. Have you ever shaded your opinions or exaggerated your  
21 opinions just because you're being paid for your time for the  
22 work that you do?

23 A. Never.

24 Q. Would you ever do anything like that?

25 A. Never.

## JURY QUESTION

1           **MR. CLUBOK:** That's all I have.

2           **THE COURT:** Okay. We have two questions from the  
3 jury, which I've shared with the parties and I'm now going  
4 to ask.

5           Would you put up the witness's demonstrative page 12,  
6 please.

7           All right. I think this is the right slide, but you can  
8 tell me if it's not.

9           Question Number 1: What is the name of the code language  
10 on Dr. Zervas's slides?

11           So without raising your hand, just kind of nod. Is this  
12 the right slide?

13           Okay.

14           All right. What's the code language?

15           **THE WITNESS:** It's Java. And I'm sorry I did not  
16 explain that. You can see along the first line it says  
17 introanalytics.java. That's what kind of gives it away.

18           **THE COURT:** All right. Here's another part of  
19 Question Number 1: Is this code the same coding language that  
20 Flo app developers used during the class period to create both  
21 the iOS and Android version of the Flo app?

22           **THE WITNESS:** Thank you. It's a complex answer. I  
23 will take it slowly.

24           So on iOS, you use a different set of languages to create  
25 apps. You might use something called Objective-C or you might

## JURY QUESTION

1 use something more modern called Swift. These are programming  
2 languages that are used on iOS.

3 On Android -- and I am sorry if I did not make that clear.  
4 This is the Android version of the app.

5 You might use languages like Kotlin or Java.

6 What I am showing you here is not -- to directly answer  
7 your question, the Flo app was programmed in Kotlin.

8 Why is this Java? What I am showing you here is I took  
9 Dr. Egelman's apps, the APKs, if you remember, and just like  
10 other experts, I decompiled them.

11 Decompiled simply means --

12 **THE COURT:** The question is what was the language.  
13 You say it's Kotlin that the --

14 **THE WITNESS:** I can spell it for the court reporter.  
15 It's K-O-T-L-I-N that Flo programmers use.

16 **THE COURT:** Oh, Kotlin. Okay. Thank you.

17 Here's Question 2, which has two parts.

18 Question 2, Part 1: Did you see the SDK provide an option  
19 for developers to de-ID before transmitting data to Meta?

20 **THE WITNESS:** Again, thank you for your question.

21 This is not something that the SDK is concerned with.  
22 It's just an envelope.

23 So in the envelope, I can put a postcard to my family that  
24 I don't care if other people see. I can also put may tax  
25 return.

## PROCEEDINGS

1 And the analogy holds. The option to manage your privacy  
2 however you will lies with the user. So on your phones, you  
3 have options to limit ad tracking.

4 And if you turn limit --

5 **THE COURT:** Okay. Dr. Zervas, I'm going to jump in  
6 because that's not quite the question.

7 The question is: Does the SDK provide an option for the  
8 developer to de-ID before transmitting?

9 That's the question. Yes, no, I don't know.

10 **THE WITNESS:** The short answer is no.

11 **THE COURT:** The answer is no? Okay.

12 Part 2 of Question 2: Have you seen Flo try to de-ID  
13 before transmitting data to Meta?

14 **THE WITNESS:** The short answer, again, is no.

15 **THE COURT:** Okay.

16 **THE WITNESS:** I could elaborate if you want me to.

17 **THE COURT:** No, thank you. You can step down. You're  
18 excused.

19 (Witness excused.)

20 **THE COURT:** Okay. Who do we have next?

21 **MR. CANTY:** Your Honor, the plaintiffs call Stephen  
22 Satterfield. Okay.

23 (Stephen Satterfield steps forward to be sworn.)

24 **THE COURT:** Okay. I have been advised that there is a  
25 time issue with this witness, so we're going to stay a little

## SATTERFIELD - DIRECT / CANTY

1 bit later today just to finish him. Okay? And then we'll talk  
2 about the schedule for next week. All right.

3 And the attorneys are going to move briskly.

4 MR. CANTY: Yes, Your Honor.

5 STEPHEN SATTERFIELD,  
6 called as a witness for the Plaintiffs, having been duly sworn,  
7 testified as follows:

8 THE WITNESS: I do.

9 THE COURTROOM DEPUTY: Thank you. Please be seated.  
10 State your first and last name and spell it for the  
11 record.

12 THE WITNESS: My name is Stephen Satterfield. My last  
13 name is spelled S-A-T-T-E-R-F-I-E-L-D.

14 THE COURTROOM DEPUTY: Thank you.

15 MR. CANTY: May I inquire?

16 THE COURT: Please.

17 DIRECT EXAMINATION

18 BY MR. CANTY:

19 Q. Mr. Satterfield, where are you currently employed?

20 A. I'm employed at Meta.

21 Q. How long have you worked at Meta?

22 A. About 10 1/2 years.

23 Q. And could you please tell the jury what your role -- what  
24 roles you've had at Meta since you've started.

25 A. Yes. I started in 2014, and my role was manager of

## SATTERFIELD - DIRECT / CANTY

1 privacy and public policy. I was promoted to director of  
2 privacy and public policy, I think, in 2017, and then I was  
3 promoted to vice president of privacy and public policy in  
4 2021.

5 I then moved to the legal team. And I'm currently on the  
6 legal team and I've been there for the last four years. My  
7 title is vice president and associate general counsel for AI  
8 and privacy.

9 Q. Mr. Satterfield, are you familiar with the action here?

10 A. Yes.

11 Q. And you have provided testimony in this matter previously;  
12 correct?

13 A. I have.

14 Q. And you provided that testimony under oath?

15 A. I did.

16 Q. Mr. Satterfield, a substantial portion of Meta's revenue  
17 comes from advertising; correct?

18 A. Yes.

19 Q. And that was true back in 2017; right?

20 A. Yes.

21 Q. And 2018?

22 A. Yes.

23 Q. And 2019?

24 A. Correct.

25 Q. And in running an advertising business, Meta uses machine

## SATTERFIELD - DIRECT / CANTY

1 learning systems; correct?

2 A. We do.

3 Q. And Meta's advertising business uses those machine  
4 learning systems to deliver relevant ads to people; is that  
5 rate?

6 A. Yes. That's the goal.

7 Q. And that was the system that was being used in 2016;  
8 correct?

9 A. Yes.

10 Q. And in 2017?

11 A. Yes.

12 Q. And in 2018?

13 A. Yes.

14 Q. 2019?

15 A. Yes.

16 Q. Now, those machine learning systems ingest a large volume  
17 of data; correct?

18 A. I think that's fair.

19 Q. And would you describe that as billions of pieces of data?

20 A. Yes.

21 Q. And according to you, that large volume of data gets  
22 ingested by Meta because it's really important for Meta's  
23 machine learning systems to operate; correct?

24 A. I think data is important to any machine learning system.

25 Q. And that's how the machine learning system learns; right?

1   **A.**   That's part of the way. It has an algorithm that will  
2   interpret the data, but that's part of the way.

3   **Q.**   And regardless of whether the data is useful or not, it  
4   not being useful actually helps train the system as well;  
5   correct?

6   **A.**   I'm sorry. I'm not sure I understand.

7   **Q.**   Well, let me ask it this way: Information that the system  
8   finds not relevant can still be useful in training a machine  
9   learning system; correct?

10  **A.**   I guess I'm not following. I mean, I -- maybe give some  
11  examples.

12       It could be useful to know that a person, you know, hid an  
13  ad that they saw, right, because it wasn't relevant to them.  
14  I guess in that case that wasn't a useful thing and, yeah, we  
15  could learn from that and, say, not show them that ad next time  
16  or an ad like that ad.

17  **Q.**   And that's how the machine learning system works? It  
18  makes determinations on what is or is not useful in training  
19  the system; correct?

20  **A.**   I think it makes decisions about what is or isn't relevant  
21  to a person.

22  **Q.**   So if something is not relevant to a person, it still  
23  would be useful in training the system?

24  **A.**   Learning that a person found something not to be relevant  
25  to them, yeah, I think that could be useful.

## SATTERFIELD - DIRECT / CANTY

1 Q. Now, Mr. Satterfield, you're familiar with the  
2 Facebook SDK that's at issue in this case; correct?

3 A. Yes, I am.

4 Q. And one source of data for that machine learning system  
5 that powers Meta's advertising is data that Meta receives from  
6 apps that use the Meta SDK; correct?

7 A. Yes. App developers send us data. Some of that data goes  
8 into the machine learning system.

9 Q. And we can agree that when I say the Meta or the Facebook  
10 SDK --

11 (Reporter interruption for clarity of the record.)

12 BY MR. CANTY:

13 Q. We can agree that when we're talking about the Meta SDK  
14 and the Facebook SDK, we're talking about the same thing?

15 A. Yes.

16 Q. Great.

17 And some of the data that's ingested into the machine  
18 learning system comes from app event data; correct?

19 A. That's correct.

20 Q. And one type of app event data is custom app event data;  
21 right?

22 A. Yes.

23 Q. And Meta receives custom app event data from many apps; is  
24 that right?

25 A. Yes.

## SATTERFIELD - DIRECT / CANTY

1 Q. And oftentimes that app event data comes in and is  
2 identified by Meta through an ad ID; correct?

3 A. Through an -- no, I don't think that's right. And maybe  
4 I'm not understanding what you mean by ad ID. An ad ID at Meta  
5 would be something that's associated with a particular ad.  
6 That wouldn't come through an event.

7 Q. Or a device ID? A device ID like the ID for advertisers  
8 or --

9 A. Yes.

10 Q. -- the AAID, the Android ID?

11 A. Yes.

12 Q. Okay. So let's take the AAID. When custom app event data  
13 comes in that is associated with an AAID, for example, for an  
14 Android device, Meta then matches that to a known Facebook user  
15 if it can; correct?

16 A. If it can.

17 Q. So custom app event data is used to train the machine  
18 learning system; correct?

19 A. Yes. It flows into the machine learning system.

20 Q. It also can be used to create custom ad events for  
21 advertisers that you work for; correct? Or work with; correct?

22 A. So could you ask that again? I'm not sure I followed that  
23 one.

24 Q. Well, let me ask you this: Custom app event data can be  
25 used two ways to generate ad revenue for Meta; right?

## SATTERFIELD - DIRECT / CANTY

1   **A.**   I think -- so I think what you're asking about is these  
2   two things; right? A developer can use custom events in order  
3   to create what we call a custom audience, which is a list of  
4   folks who have taken a particular action in their app. If they  
5   want to reach those folks with ads back on Facebook or  
6   Instagram, they can do that through what we call a mobile app  
7   custom audience. And that happens through that matching  
8   process that you described. We can identify that person and we  
9   can, say, show them an ad that that developer or advertiser  
10  wants to show them?

11       And then the second way is sort of harder to understand,  
12  and you're going to reach the limits of my knowledge on machine  
13  learning. But it also flows into the ad system and can improve  
14  the ad system overall by helping it to sort of learn patterns  
15  of activities that happen across our apps, so Facebook and  
16  Instagram, and third-party apps.

17  **Q.**   In both ways that you just described, both of those ways  
18  help Meta generate revenue; correct?

19  **A.**   Yes.

20       **MR. CANTY:** Your Honor, I have --

21       Your Honor, I have Exhibit 106, 1260, and 1264 that I'd  
22  like to move into evidence.

23       **THE COURT:** All right. Any objection?

24       **MS. McCLOSKEY:** No objection.

25       **THE COURT:** All right. 106, 1260, and 1264 are

## SATTERFIELD - DIRECT / CANTY

1 admitted.

2 (Trial Exhibits 106, 1260, 1264 received in evidence.)

3 MR. CANTY: I'd like to pull up Exhibit 106.

4 BY MR. CANTY:

5 Q. Mr. Satterfield, it's your position that Meta takes data  
6 privacy seriously; correct?

7 A. Yes, we do.

8 Q. And it's your position as -- what was your title again?

9 A. It's vice president and associate general counsel for AI  
10 and privacy.

11 Q. So you're the associate general counsel for AI and  
12 privacy.

13 What was your title between 2016 and 2019?

14 A. Changed a bit. So in 2016, it would have been manager of  
15 privacy and public policy. I got promoted, I think, in  
16 late 2017, and it became director of privacy and public policy.

17 Q. So it's fair to say that during the relevant time period,  
18 the class period here, you were involved with privacy issues  
19 and making sure that Meta stood fast to its promise to protect  
20 data privacy; correct?

21 A. Yes.

22 Q. Great.

23 Now, in 2019, you became aware at the end of the class  
24 period on February 28, 2019, that there was going to be some  
25 reporting with respect to Meta collecting sensitive health data

## SATTERFIELD - DIRECT / CANTY

1 improperly; correct?

2 A. Yes.

3 Q. All right. I'd like you to take a look at what's been  
4 marked as Trial Exhibit 106.

5 Do you see that in front of you?

6 A. I do.

7 Q. And your name is on this e-mail chain; correct?

8 A. Yes. That's me.

9 Q. And this e-mail was from February 28th, 2019?

10 A. Yes.

11 Q. And the subject line reads "Rough notes E and C phone  
12 briefing on WSJ"; right?

13 A. Correct.

14 Q. And what's E and C mean?

15 A. E and C here refers to the Energy and Commerce Committee  
16 at the U.S. House of Representatives.

17 Q. And are you aware that Meta claimed in its opening  
18 statement that there was a February 2019 Wall Street Journal  
19 article concerning Flo Health and Meta?

20 A. Yes.

21 Q. And you've seen this document that I'm showing you right  
22 now, Trial Exhibit 106; correct?

23 A. Not for a while, but it looks like it was sent to me, yes.

24 Q. Well, you were deposed less than two weeks ago --

25 A. Oh, if you're asking about that, then, yes, I saw it at my

1 deposition.

2 Q. Okay. So you saw this document --

3 A. Yes --

4 (Reporter interruption for clarity of the record.)

5 THE COURT: You don't have to hurry too fast.

6 (Laughter)

7 BY MR. CANTY:

8 Q. Okay. Let's take a look at the middle of the page where  
9 it says "Steve" --

10 Well, let me ask you this:

11 This is a compilation of a conversation that multiple  
12 people were having, and this is a recording of that  
13 conversation; correct?

14 A. Like these are rough notes from a conversation.

15 Q. But you don't dispute the accuracy of the information that  
16 was included in this; correct?

17 A. Look, these are -- these are rough notes. I looked at  
18 this in my deposition. I mean, they're filled with typos. I'm  
19 not even sure whose notes these are.

20 So it's -- they're probably generally correct, but I --  
21 you know, there may be inaccuracies here and there.

22 Q. Okay. But when you testified at your deposition, you said  
23 that they were generally --

24 A. That's generally right --

25 (Reporter interruption for clarity of the record.)

1 BY MR. CANTY:

2 Q. Let's take a look at the middle of the page where your  
3 name comes up. Do you see that where it says "Steve"?

4 A. I do.

5 Q. Okay. And it says (as read):

6 "Steve" -- this is you -- this is a recitation  
7 of what you were saying

8 "Two ways this data can be used to show ads to  
9 people. Let's back up. Custom events? what's going  
10 on here? Way of app developed to keep track of  
11 actions people are taking in an app. Lots of reasons  
12 why they may want to track that create events. Then  
13 there are specific things. So we let" -- and there's  
14 a typo here.

15 Do you agree it should say "developers"?

16 A. Yes.

17 Q. (as read):

18 -- "define for themselves what they want to  
19 track if you are a developer that you want to keep  
20 track of something in the app, so we can take the  
21 list you send us and show them ads. This is the  
22 custom audiences product. The nuance when we receive  
23 data we can get -- we can use it to improve our  
24 services, including advertising services. Improves  
25 quality of ads, but we do not target individuals

## SATTERFIELD - DIRECT / CANTY

1 directly. Overall improvement to ads system but not  
2 a one-to-one relationships apart from custom  
3 audiences targeting."

4 Do you see that?

5 **A.** Yes.

6 **Q.** Did I read that correctly?

7 **A.** You did.

8 **Q.** So separate and apart from the custom audiences that we  
9 discussed earlier, according to you, custom app events that  
10 Meta ingests improves the quality of Meta's ads, but not on a  
11 one-to-one basis with the user from whom you were getting that  
12 information from?

13 **A.** That's correct.

14 **Q.** So it's fair to say that someone could give you private,  
15 sensitive health information that you use to improve your  
16 advertising systems, but they never got an ad; correct?

17 **A.** Okay. So first of all, our business tools terms, which  
18 would govern --

19 **Q.** I'm just asking my questions, which is whether or not that  
20 is a fact.

21 **MS. McCLOSKEY:** Objection.

22 **THE COURT:** Overruled. Go ahead.

23 **THE WITNESS:** Could you ask the question again.

24 **MR. CANTY:** Yes.

25 \\\

1 BY MR. CANTY:

2 Q. You can use sensitive health information that gets  
3 ingested into the machine learning system whereby it benefits  
4 Meta in improving ads but that the user where you got that  
5 information from may never get an ad related to that; correct?

6 A. We can receive data, right, and use it to tailor ads or to  
7 improve the ad system, right, regardless of whether we receive  
8 data from that particular person.

9 Q. That's not what I asked.

10 A. Regardless of whether we show an ad to that person. I  
11 think that is what you asked.

12 Q. Right. So when the -- the claim is that no user got an ad  
13 based on the information they provided, that doesn't mean that  
14 Meta didn't benefit from having that information; correct?

15 A. I think it's a fair statement to say that we benefit from  
16 the app event data that we receive.

17 Q. So you would agree with me that simply because somebody  
18 doesn't get an ad doesn't mean you don't use their data?

19 A. That's correct, yes.

20 Q. Okay. Now, according to your prior deposition, you said  
21 that Meta improves its advertising system for two main  
22 objectives; right?

23 A. Yes.

24 Q. What are those two main objectives?

25 A. So two things. The first is that we think there is value

1 in -- in the ads themselves; right? Connecting people to  
2 businesses or products and services that they may be interested  
3 in, causes that they want to donate to, there's value there.

4 But there's a bigger value that comes through showing ads  
5 to people, and that's how we enable -- that's how we provide  
6 services for free. So if you use Facebook, you use Instagram,  
7 you use WhatsApp, Messenger, or Threads, chances are you're not  
8 paying for them. The reason you're not paying for them is  
9 because of advertising. Advertising pays for those services.

10 Q. So is it your system -- is it your testimony that that's  
11 the tradeoff that users have; they get something for free and  
12 then you get their data?

13 A. Well, I don't think it's a tradeoff between free services  
14 and data. I think it's a tradeoff between seeing ads and  
15 getting something for free.

16 Q. Let's go back to the custom app events and the Facebook  
17 SDK.

18 You understand and you agree that Meta received custom app  
19 events through the Facebook SDK from the Flo Health app;  
20 correct?

21 A. I don't mean to quibble. I don't think it's through the  
22 SDK. I think that the SDK is built into the Flo app. The  
23 Flo app sends the app events to Facebook.

24 Q. And that information is then used by Facebook; correct?

25 A. It may be.

## SATTERFIELD - DIRECT / CANTY

1 Q. And you have no reason to doubt that that custom -- the  
2 custom app events from the Flo Health app were made available  
3 and ingested into Meta's machine learning system that we just  
4 discussed; right?

5 A. I don't really have a basis to have an opinion about that.  
6 It's possible that they were, but I wouldn't know for sure.

7 Q. Well, would there be a reason why it wouldn't be ingested  
8 into the system?

9 A. If there had been bugs on what was being sent, errors on  
10 our side. I think there could be plenty of reasons why it  
11 wouldn't have been ingested into the system.

12 Q. So the default position, though, is that it's ingested  
13 unless there's one of those things you're talking about, a bug  
14 or some sort of malfunction?

15 A. Well, there's also -- we have filters to discard certain  
16 data that we could have received from a particular app, and so  
17 if those filters were triggered, that data would have been  
18 dropped?

19 So there are a number of reasons why we wouldn't have  
20 ingested the data.

21 Q. I'm glad you brought up filters.

22 During the class period, can you describe the filter that  
23 you had that specifically excluded sensitive health data from  
24 health apps?

25 A. So the filter we have was built to exclude personally

1 identifiable information.

2 Q. That's not what I asked. My question to you is I want you  
3 to describe to the jury the filter you had to preclude  
4 sensitive health data from health apps during the class period.

5 A. So if you're asking me did we have something that was  
6 focused on health-related terms, the answer is no. That was  
7 something we built later. We built that in 2019.

8 In 2018 we had a filter that was focused on PII, the  
9 things like Social Security numbers, driver's license numbers,  
10 bank account numbers.

11 Q. So during the class period, you had no filter or safety or  
12 procedure in place to filter out sensitive health data that you  
13 were collecting from health apps?

14 A. We had the PII filter that I described and we had policies  
15 that advised developers not to send us that stuff in the first  
16 place.

17 Q. Now, would you agree with me that where a woman is in her  
18 menstrual cycle would be considered sensitive health  
19 information?

20 A. I mean, sitting here, I -- I mean, health information is  
21 so context-dependent, it's hard for me to have an opinion about  
22 these kinds of things.

23 Q. As a human being, sitting here, you don't have an opinion  
24 as to whether or not where a woman is in her cycle is sensitive  
25 health information?



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1 child? I think people are very open about that.

2 Is it -- I mean, are you like in the process of trying? I  
3 mean, that's going to be different.

4 But the thing is that these things are extremely  
5 context-dependent and they depend on the person. It's hard to  
6 make sort of universal judgments about these kinds of things.

7 Q. Were you here --

8 A. It's tough.

9 Q. Were you here for the testimony of the five named  
10 plaintiffs in this case?

11 A. I sat in on, I think, part of one of them.

12 Q. And almost all -- all of them told you that where they  
13 were in their menstrual cycle and whether or not they were  
14 ovulating or pre-ovulating or on their period, they considered  
15 sensitive health information.

16 You heard that testimony?

17 A. Yes.

18 Q. And it's your position that those opinions are  
19 context-dependent?

20 A. I think they're personal. And if those women said that,  
21 then that's what they believe. I think different women could  
22 think differently.

23 MR. CANTY: Now, can we put up Exhibit 1260, please.

24 BY MR. CANTY:

25 Q. Do you recognize what's been marked as Trial Exhibit 1260?

## SATTERFIELD - DIRECT / CANTY

1 A. Yes, I do.

2 Q. This is an e-mail that was sent to you on February 27,  
3 2019; correct?

4 A. This is a chat. This is like an instant messaging chat.

5 Q. Okay. So this is, again, a chat with multiple people,  
6 including you; correct?

7 A. That's right.

8 Q. And this was the day before the end of the class period;  
9 is that right?

10 A. I'll have to take your word. I don't know when the class  
11 period ended in this one.

12 Q. February 28th, 2019.

13 A. Okay.

14 Q. And, again, the Wall Street Journal article had come out  
15 on February 22nd, 2019; right?

16 A. That sounds right.

17 Q. So this e-mail is about five days after the article?

18 A. Yes.

19 Q. And do you see the line where it says (as read):

20 "One thing you should know is that we do use  
21 event data, including custom events, for ads."

22 Do you see that?

23 A. Yes.

24 Q. And this was in response to the custom events that Meta  
25 was collecting from the women that entered their private,

1 sensitive health data on the Flo app; correct?

2 **A.** This was -- this was -- I think this was about questions  
3 that we were getting after that article came out, and there  
4 were questions about whether we used the information that was  
5 discussed in the article for ads, and I wanted to make sure  
6 that this team understood that we did.

7 **Q.** And you see you put "do" in all caps; right?

8 **A.** Yes.

9 **Q.** All right. So how long have you known prior to the  
10 Wall Street Journal article that Meta was taking in sensitive  
11 health data from women from -- from health apps?

12 **A.** I don't know that I -- I mean, I take issue with the way  
13 that you're describing this.

14 I was aware, of course, that Meta received data from apps  
15 that used -- sorry. Facebook. I think we're using the term  
16 "Facebook" here.

17 **Q.** Sure.

18 **A.** That Facebook received data from apps that used the SDK, I  
19 would have known about that. That would have --

20 But in terms of like what you were describing about  
21 sensitive health information, I -- I don't quite agree with  
22 that. I'm not sure I'm following you.

23 **Q.** I appreciate you don't agree with me, but you were the  
24 head of privacy. You held multiple positions as manager and  
25 now as senior vice president of privacy.

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1           My question to you is: how early did you learn that there  
2       were custom app events that contained private, sensitive health  
3       information being taken in by Meta from these -- from these  
4       health apps?

5       **A.**    I see.   I see.

6       **Q.**    Was it 2016?

7       **A.**    So I think I would have been generally aware of this risk;  
8       right? We built a policy around this risk.

9       **Q.**    So I'm just asking you --

10           **MS. McCLOSKEY:**  Objection, Your Honor.

11       **BY MR. CANTY:**

12       **Q.**    And I hate to interrupt --

13           **MS. McCLOSKEY:**  Objection.

14       **BY MR. CANTY:**

15       **Q.**    -- just tell me when you first were aware of it.

16           **MS. McCLOSKEY:**  Objection, Your Honor.

17           **THE COURT:**  Okay.  Overruled.

18           Just slow down.  Let him have a chance to answer.

19           But go ahead.  Just start over.

20           **THE WITNESS:**  So I want to be clear about what I'm  
21       saying here about what I was aware of.

22           I would -- I was -- I worked on ads at the company.  This  
23       was one of my jobs on the public policy team.  And I would have  
24       been aware that app developers were able to send Facebook event  
25       data.  Like that's -- that was my awareness.  I would generally

1 have been aware of that.

2 And I was aware of the risk that app developers would send  
3 us certain information that we didn't want to receive, and that  
4 could have included health information.

5 **BY MR. CANTY:**

6 **Q.** When did you first learn of that risk? Was it 2016?

7 **A.** We had a policy around it. I mean, we were -- we were  
8 aware of the risk. That's why we built the policy, was to  
9 instruct developers not to send us that data.

10 **Q.** So you set up a policy in 2016 to preclude the collection  
11 of sensitive health data? Is that your testimony?

12 **A.** I think the policy that we had predates that period.

13 And this was -- this was due to an awareness that  
14 developers were able to send us different data.

15 **Q.** My question to you --

16 **A.** A developer could have inadvertently sent us something  
17 that we didn't want. That's why we built the policy around it.

18 **Q.** There came a time where you became acutely aware of the  
19 fact that custom app events from the Flo Health app contained  
20 information about ovulation; correct?

21 **A.** I think what you're asking is that -- I became aware of  
22 this -- this -- this set of press stories that made those kinds  
23 of allegations around the time when this Journal article came  
24 out, which would have been February of 2019.

25 **Q.** Okay. So you don't know about any of this in 2018?

## SATTERFIELD - DIRECT / CANTY

1 A. I knew about this general risk, which is why we had a  
2 policy and why we educated developers and told us not to --  
3 told them not to send us that kind of information.

4 But in 2019, there were these articles. These articles  
5 made these allegations, and that's why we're having the  
6 conversation in this document.

7 Q. So in 2016 when -- you saw the testimony that users were  
8 entering into the Flo Health app intimate information about  
9 their reproductive health; correct?

10 A. I saw the testimony -- could you ask that again?

11 Q. Yeah. The testimony that users were entering very private  
12 and intimate information about their reproductive health into  
13 the Flo health app; correct?

14 A. Are you talking about the testimony from the plaintiffs in  
15 this case?

16 Q. Well, we heard it from the experts. We heard it from the  
17 plaintiffs.

18 A. I saw the functionality of the Flo Health app, yeah.  
19 Flo app.

20 Q. And you heard testimony that custom app events and  
21 parameters like "get pregnant", ovulation, fertility window  
22 were, in fact, shared with Meta; correct?

23 A. Well, I think that's something different. I think that  
24 there's the data that's entered into the app --

25 Q. I'm asking about what was shared with Meta, which were the

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1 parameters --

2 MS. McCLOSKEY: Objection, Your Honor. The -- counsel  
3 keeps interrupting --

4 THE COURT: Okay, that's fine. No, please. I will  
5 call for you an explanation. Don't talk unless I ask for it.  
6 But you've all been violating that rule too much. State the  
7 rule and be quiet. I will take it from there.

8 Is that clear?

9 MS. McCLOSKEY: Yes, Your Honor.

10 THE COURT: All right. Just start over again.

11 MR. CANTY: Yes.

12 BY MR. CANTY:

13 Q. I'm asking you about testimony regarding the parameters;  
14 for example, get pregnant, track cycle, ovulation in five days,  
15 period, past fertility window.

16 You're aware that that information was being sent to Meta  
17 in 2016; correct?

18 A. In 2016? So I think it's really important that we're  
19 clear about exactly what -- what I've seen and what I was aware  
20 of?

21 You're talking about parameters. This is text that  
22 accompanies a custom event.

23 I don't think that's what the parameters were that I saw  
24 in the testimony before. I don't think those were the  
25 parameters.

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1 Q. You don't think that "get pregnant," "track cycle,"  
2 "pregnant," were the parameters that were sent to Meta?

3 A. I don't think those were the parameters. Those may have  
4 been part of the event name, but -- I mean, I wasn't watching  
5 the testimony very closely.

6 Q. Well, that's -- I think that's where my concern comes  
7 from.

8 In -- you don't even know now, as you sit here today, in  
9 2016, 2017, 2018, and 2019, this information was being sent to  
10 your company, and nobody knew about it or did anything to stop  
11 the collection of this sensitive data; correct?

12 A. Okay. Previously you were asking me about what I had seen  
13 from the other witnesses who had testified. I just want to be  
14 clear: I don't recall exactly what -- what they said. I was  
15 here and I was in and out and I've got other things.

16 But did I -- what did I know in 2018, 2019?

17 So I think it's important that I describe a little bit  
18 about what I was doing at the company at that point. I worked  
19 on the public policy team; right? And my job would have been  
20 to think about, you know, in a moment like this, are our  
21 policies in the right place; are there different things that we  
22 should do to enforce those policies. I wouldn't have been  
23 involved in sort of an individual investigation of a particular  
24 app, whether it be Flo or any other app.

25 Q. Well, from a policy perspective, you could have simply

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1 said, I want a policy at Meta that we don't collect any  
2 sensitive health data from women that are using fertility apps.

3 Nothing precluded you from making that recommendation in  
4 2016; correct?

5 **A.** We had a policy in 2016 that said that we didn't want any  
6 information -- any health information.

7 **Q.** That's not what I asked you, sir. I didn't ask what you  
8 wanted the apps to do.

9 You could have come up with a policy or recommended a  
10 policy to Meta saying: We need to preclude the collection of  
11 this. We will stop it. We're not going to ask others to not  
12 do it. We are going to take affirmative steps to make sure  
13 that we don't collect that information.

14 You could have recommended that policy; correct?

15 **A.** We had a very broad policy. It was focused on telling  
16 developers not to send us that data in the first instance.

17 We eventually built filtering that sort of added to that  
18 policy by letting developers know when they may have sent us  
19 something that could have violated our policy as an opportunity  
20 for additional education of those developers.

21 So I think we had a robust policy in place. We had  
22 education for developers. And we relied on the fact that they  
23 were the ones who were best situated and able to control the  
24 information that they were sharing with Facebook.

25 **Q.** I appreciate that.

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1 And you testified before Congress; correct?

2 A. I did.

3 Q. Yeah. So my question was actually whether or not you  
4 proposed a policy to forbid Meta from collecting that  
5 information, not what you told app developers to do. Please  
6 listen carefully to my question.

7 You could have suggested a policy to Meta executives  
8 saying, we need to stop the collection of this data from --  
9 from reproductive health apps; correct?

10 You could have made that recommendation; right?

11 A. I -- I thought we had a policy that prohibited that kind  
12 of data transmission. I didn't think I would need to.

13 Q. No, your policy was to tell app developers, "please don't  
14 send it," while doing nothing while the information was being  
15 collected and used for profit by Meta; correct?

16 A. I don't think it's fair to say that we did nothing. I  
17 mean, we -- we had the policy in place. We educated  
18 developers. If developers had been managed, they would have  
19 gotten additional education through their client partners.

20 I don't think it's a fair characterization to say that we  
21 did nothing. And we improved over time.

22 Q. You claim that you put in a policy in 2017 that dealt with  
23 PII; correct?

24 A. That was 2018. But yes.

25 Q. 2018. Again, in, 2018, you didn't recommend: Hey, we

1 have to stop collecting sensitive health data that's coming in  
2 through these custom app events from period tracking apps like  
3 Flo.

4 Correct?

5 **A.** I don't think we had any discussion about period tracking  
6 apps in 2018.

7 **Q.** Sir, you told this jury you and Meta take privacy  
8 seriously. These women came in here and told you that for the  
9 better part of three years, you were collecting sensitive  
10 reproductive health information from them; and you're telling  
11 me that you put the responsibility on making sure that you  
12 didn't collect that on others, not Meta.

13 Is that right? Do I have that correct?

14 **A.** So developers choose to send us data. They are the ones  
15 who best know what data that is, what it means, and they're the  
16 ones who are best able to prevent it from coming if it  
17 shouldn't come.

18 So that's the way that we approached that issue.

19 **Q.** Sir, your company is the largest ad and data aggregator in  
20 the world. You're telling me you didn't have the people power,  
21 the employees, or the technology to preclude Meta from  
22 collecting this sensitive health data during the class period?  
23 Is that your testimony?

24 **MS. McCLOSKEY:** Objection.

25 **THE WITNESS:** We had an approach that focused on

1 educating developers who were best positioned to control the  
2 data that they send to Facebook. That approach evolved over  
3 time. It evolved over time. We built the PII filter in 2018.  
4 We built the health terms filter in 2019.

5 And I should say that our practices were in line with the  
6 rest of the industry, which this -- practices are not uncommon.  
7 They're very common, as I think the experts testified, and our  
8 practices were in line with the rest of the industry.

9 **BY MR. CANTY:**

10 **Q.** You're saying that because the industry was doing it, then  
11 it was okay for you to do it?

12 **A.** I think we consider the industry when we're considering  
13 what the -- you know, what kind of mitigations we would put in  
14 place.

15 **Q.** You know that other large corporations have, you know,  
16 made that argument as well; correct? For example, opioid  
17 manufacturers or opioid distributors have made that argument?

18 **A.** I'm not --

19 **MS. McCLOSKEY:** Objection.

20 **THE COURT:** Overruled.

21 You can answer. Go ahead.

22 **THE WITNESS:** I'm not aware of that. But it's one  
23 input that we consider when we're building our policies, which  
24 is: How do other big companies handle these kinds of things?

25 We actually got out ahead of our peers in building the PII

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1 filter and building the health data filter. I'm proud of the  
2 work we did here.

3 **BY MR. CANTY:**

4 **Q.** You have no regret over the fact that you collected all  
5 this information during the class period?

6 **A.** No, I don't.

7 **Q.** In fact --

8 **A.** We collect data to show people relevant ads. That enables  
9 them to get free services. That enables small businesses to  
10 advertise on our platforms.

11 **Q.** The -- one of the reasons why you didn't want to stop this  
12 coming in was for money; isn't that right?

13 **A.** I'm sorry. We -- we did want to stop health data from  
14 entering our systems. That's why we had a policy around it.

15 **Q.** You weren't aware there was a concern -- internal concern  
16 at Meta that if you clamped down on the type of custom app  
17 events you were collecting, it may affect the bottom line of  
18 Meta?

19 **A.** I mean, I can't think of anything right here where that  
20 would have been a discussion, but we do consider the revenue  
21 impact of different actions that we take. It would be  
22 irresponsible not to. But that's not what drives these kinds  
23 of decisions.

24 **MR. CANTY:** I'd like to look at Trial Exhibit 1264.

25 **MS. McCLOSKEY:** Counsel, is this the correct version?

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1 MR. CANTY: I'm sorry?

2 MS. McCLOSKEY: The version in my binder isn't the  
3 correct version.

4 (Counsel conferring.)

5 BY MR. CANTY:

6 Q. Sir, do you see this document?

7 A. I'm sorry. Which --

8 Q. This is 1264.

9 A. Is this the one that starts "Thanks so much, Steve"?

10 Q. Yes.

11 A. Yes, I'm with you.

12 Q. And this is your e-mail to Rob Sherman on March 24, 2019;  
13 correct?

14 A. Yes, it is.

15 Q. And who is Rob Sherman?

16 A. Rob Sherman is Meta's deputy chief privacy officer for  
17 policy.

18 Q. And did you report to Rob Sherman during -- at March 24,  
19 2019?

20 A. No. Rob and I were peers. I reported to Aaron Eagan, who  
21 was the chief privacy officer.

22 Q. And you see where it says -- the sentence on the first  
23 bullet point that starts (as read):

24 "We're facing increasing scrutiny about our  
25 collection and use of data from partners,

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1 particularly data we receive through the Facebook  
2 business tools, e.g., mobile app SDK."

3 Do you see that?

4 **A.** I do.

5 **Q.** So this data is, quote, "in."

6 And if you look at the third bullet point, it reads (as  
7 read):

8 "These stories and inquiries focus on the fact  
9 that we receive data from many third-party sites and  
10 apps, allege that people may not expect to receive  
11 it, question whether we have sufficient privacy  
12 protections in place."

13 Do you see that?

14 **A.** Yes, I do.

15 **Q.** Then you list some questions.

16 "Questions to focus on: Notice to user, whether  
17 and how we obtain consent, how we use data we receive  
18 and whether we use it for ads, whether we limit what  
19 kind of sites apps can use our tools, and whether we  
20 limit what kinds of data they can send us."

21 Do you see that?

22 **A.** I do.

23 **Q.** And what was the date on this e-mail?

24 **A.** This e-mail is March -- sorry. March 24, 2019.

25 **Q.** This is March 24, 2019. This is after the class period;

1 correct?

2 A. Yes.

3 Q. And this is the first time we see any e-mail where you're  
4 asking about whether or not we get consent, whether we limit  
5 the kind of sites and apps that can use our tools, and whether  
6 we limit what kinds of data they can send us; correct?

7 A. I'm sorry. What was the beginning of your question? I  
8 didn't catch it. This was the first --

9 Q. This is the first time we see an e-mail where you're  
10 raising these issues; correct?

11 A. This is the first that you and I have looked at together?

12 Q. No, that -- that we see -- any -- that's been produced in  
13 discovery that we've seen in that case where you've raised the  
14 issue of whether or not "we limit the kind of sites and apps  
15 that can use our tools."

16 MS. McCLOSKEY: Objection.

17 THE COURT: You can answer.

18 THE WITNESS: I don't -- I don't know whether there  
19 were other e-mails about this. I assume there probably were.

20 BY MR. CANTY:

21 Q. Well, it's fair to say that the concern was a PR concern,  
22 not a legitimate concern for the women, because this only  
23 happened after there were potential press reports exposing your  
24 conduct; correct?

25 A. I'm sorry. This -- what do you mean by "this" --

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1 Q. Your concern only came to the fore after there were  
2 alleged press reports about your conduct and not because you  
3 were truly concerned about the privacy of these women; right?

4 A. Well, I think it's important to understand what this is.  
5 This is a set of -- this is information about inquiries that  
6 are coming in after this article. This is a summary of those  
7 inquiries that we were getting. These are -- as I --

8 I don't quite agree with the way that you've put that.

9 Q. Well --

10 A. This is a -- this is a summary of questions that we were  
11 getting after those articles came out.

12 Q. Well, the one question deals with what I asked you about  
13 before, "whether we could limit which kinds of sites and apps  
14 can use our tools."

15 So, again, you had the ability to shut off access to apps  
16 that were sharing this data to you; correct?

17 A. Well, just to be clear, these are questions that we're  
18 getting from folks that we're talking to.

19 Q. I understand that. My question to you is: That's a  
20 question that I'm -- that I asked you before. You had the  
21 ability to shut off access to apps that were sending you this  
22 sensitive health data; correct?

23 A. I'm -- I'm not sure I follow. "Shut off." I -- could you  
24 explain what you mean by "shut off access"?

25 Q. Okay. The SDK sends information to -- to Facebook. You

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1 use it for custom app events --

2 A. Mm-hmm.

3 Q. -- ad events and you use it for machine learning; right?

4 A. That's fair, yes.

5 Q. If -- let's say, for example, a -- an app was sending you  
6 child pornography. You -- you could immediately shut off the  
7 ingestion of that information; correct?

8 A. Could we filter out information? Yes, we were able to  
9 filter out information. That's why we built the PII filter.  
10 That enabled us to filter out. Later we built the health data  
11 filter. That enabled us to filter out certain data.

12 So I think the answer is yes.

13 Q. I'm not asking about filtering out. I'm asking about  
14 stopping it so it doesn't even come in, building a firewall,  
15 precluding the information from ever being ingested by Meta.

16 You had the ability to do that; correct?

17 A. I think we're saying the same thing. That's what  
18 filtering is. That's -- we would prevent that data from coming  
19 in.

20 Q. Okay. So by filtering, you had -- we can agree that  
21 filtering and essentially stopping it from ever coming into  
22 Meta's systems are the same thing?

23 A. Yes, I think that's right.

24 Q. And then let's look on that document. It says (as read):

25 "Many of these are new questions, of course.

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1       Been getting them for years."

2       Do you see that?

3   **A.**   Yes, I do.

4   **Q.**   Isn't it a fact that you knew that this had been an issue  
5   and was an issue for years, and it was only because of these  
6   press inquiries that you finally decided to take action?

7   **A.**   No. I'm actually saying the -- the opposite here. And so  
8   "Many of these aren't new questions, of course. Been getting  
9   them for years."

10       But there's a focus on our policies around data collection  
11   that we haven't seen as much before now. So what this says is  
12   that we actually weren't getting these kinds of questions  
13   before now.

14   **Q.**   You read -- you read the point that "we haven't seen as  
15   much before now" meaning this is the first time you're hearing  
16   about them?

17   **A.**   Maybe not the first time, but there -- there hasn't  
18   been --

19       So this document deals with a lot of stuff; right? And  
20   the articles that are cited up here, they deal -- some of them  
21   deal with the stuff that the Wall Street Journal article was  
22   talking about. Others deal with other things.

23       But as a general matter, we were getting questions earlier  
24   about app developers', websites' ability to send us information  
25   and our ability to use that information for ads and analytics.

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1 There were lots of questions about that.

2 But this kind of question, I think we hadn't gotten as  
3 much before. That's the point here in the e-mail. This kind  
4 of question about these prohibitions and our business tools  
5 terms against sending us certain kinds of sensitive  
6 information.

7 Q. Well -- okay. Let's talk about the end of the class  
8 period and where you're getting these inquiries.

9 What -- what policy initiative did you mandate or what  
10 action did you ask Meta to take, separate and apart from  
11 dealing with the press, to stop the collection of the  
12 information in February of 2019?

13 A. So I -- I think that, you know, as a result of lot of this  
14 engagement that's being recapped in this e-mail, we decided to  
15 try to build a filtering system for health-related data.

16 So that was -- that was the sum of the work that came out  
17 of this. This was a tough thing too do. That -- that was work  
18 that happened over the course of 2019, and I think we rolled it  
19 out in late 2019. So that was the -- yeah.

20 Q. So the better part of 10 months to finally roll out this  
21 health privacy initiative? Is that what your testimony is?

22 A. Yeah, that's right. This is a hard thing to build. No  
23 one had ever built it.

24 Q. Have you ever heard the term "go fast and break things"?

25 A. I think you're talking about "Move fast and" --

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1 Q. "Move fast and break things." Thank you.

2 A. Yeah, I have heard about it.

3 Q. Who -- who came up with that moniker?

4 A. I don't know. It would have been somebody in our company.

5 Q. Is it Mark Zuckerberg?

6 A. I don't know if it was Mark --

7 Q. Okay.

8 A. -- but it -- yeah. It was a saying that was popular  
9 around the time I joined. It was eventually retired.

10 Q. Yeah, the con- -- yeah, it was, because the concept behind  
11 it was basically "Do whatever you want and deal with the  
12 consequences later"; right?

13 A. That was not the concept. And I think the  
14 misunderstanding about what that was is one of the reasons why  
15 it was retired. It was about -- it was an engineering sort of  
16 mantra which was about building things, trying new things,  
17 innovating. "Hacking" is like the other term that is often  
18 misused. It was about moving fast and experimenting.

19 Q. Right. So like moving fast with SDKs and collecting  
20 private health data without worrying about the consequences;  
21 correct?

22 A. No. That's -- no. We disagree on that. We didn't want  
23 health data. Our policies going back all the way through the  
24 class period said that we didn't want health data.

25 Q. Have you ever heard the term "Actions speak louder than

1 words"?

2 **A.** Yes, I have.

3 **Q.** I know you keep saying that, but can you point to any  
4 affirmative actions that you took in your role as a privacy  
5 officer at Meta to stop the collection of the data during the  
6 class period?

7 **A.** To stop the --yes, I supported the policies. Right?

8 And look, we worked on -- we supported these products. We  
9 worked with the product managers and engineers to talk about  
10 the ways in which these products operated and the ways in which  
11 developers could send us information. We made a number of  
12 decisions along those lines. We built the PII filter. That's  
13 a good example. We improved the education that we provided to  
14 developers.

15 I'm pretty proud of the work that we did during this  
16 period. I am.

17 **Q.** Oh, I'm sure you are.

18 My point, though, is not what you told others to do; it's  
19 what you did.

20 And my question, again, is: You believe the policy and  
21 initiative actions you took by telling app developers "Please  
22 don't send us this data" was sufficient?

23 **A.** We relied on education and we thought that that was the  
24 right approach, given that developers themselves were in the  
25 best position to control which data that they sent to us. Over

1 time, that approach -- that approach developed.

2 Q. And we can agree that that approach fails because you  
3 continued to collect health data from these apps, specifically  
4 the Flo Health app, so your initiatives and attempts to try to  
5 step them failed; correct?

6 A. I don't think that that's quite right.

7 Q. Well, they continued to send the data after repeated  
8 requests not to; right? These automated requests that you sent  
9 to them?

10 A. I'm sorry. Who sent data?

11 Q. Well, were you aware -- all right. Let's go to this line  
12 of questioning.

13 Were you aware that -- and there was an automated system  
14 that sent a form e-mail to Flo saying -- I'm paraphrasing, and  
15 I can show it to you -- saying "You may be violating our rules.  
16 Please stop sending us data if it's for children under 13 or  
17 financial data or health data"?

18 Were you aware that there was a form e-mail that went out  
19 in December of 2018, at the end of the class period?

20 A. Yes. So I think what you're describing is this is the way  
21 the PII filter would work. If the PII filter had been  
22 triggered, there would have been a notification that went to  
23 the developer advising them to check which information that  
24 they were sending to us. Right?

25 Again, they're the ones who make those decisions, and they

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1 are the ones who are in control of that data. It would have  
2 reminded them to check, and it would have reminded them of the  
3 policies that we had in place that prohibited them from sending  
4 us things like health data.

5 Q. All right. So that's not what I asked. My question was:  
6 Were you aware that one of those form letters or e-mails went  
7 out to Flo in December of 2018?

8 A. I learned that in the course of preparing for my  
9 deposition.

10 Q. And you said they control the data, but the reality is you  
11 control the data when you take it in through the SDK and put it  
12 into your machine learning systems; correct?

13 A. They control what they send to us.

14 Q. And then you control it when you get it?

15 A. I mean, once we have it, I guess it's in our control,  
16 yeah.

17 Q. Okay. And so you -- you weren't aware in your role as a  
18 privacy officer that the Flo Health app --

19 And we can agree that Flo Health is a health app; right?  
20 It's Flo.health. Can we agree on that?

21 A. It's called the Flo app.

22 Q. You're aware their website is Flo.health?

23 A. If it is, okay.

24 Q. So we can agree that it's a health app?

25 A. Yeah.

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1 Q. Okay. Great.

2 Now, with respect to this form letter that went out, I'm  
3 sure you had a robust policy and procedure to follow up with  
4 these apps that get these notifications to make sure they're  
5 complying with your e-mail; correct?

6 A. So I -- I think what you're -- so you're describing the --  
7 the notification that would have gone out when they sent a PII  
8 that triggered the filter or they -- you know, they sent  
9 something that triggered the filter.

10 Following up, I think what you're describing -- and I know  
11 we're not looking at it -- there actually was some  
12 correspondence between Facebook and Flo. I think Flo responded  
13 to the e-mail. I don't know whether there would have been  
14 additional correspondence.

15 But what -- what was described in the document that I  
16 think you're referring to is exactly what we would hope a  
17 developer would do; right? A developer gets this e-mail. They  
18 check the data that they're sending to us. They reach out to  
19 us, and there's an opportunity for discussion about that.  
20 That's a -- that's a great exchange.

21 Q. Well, let's look at it. This is --

22 A. Okay.

23 Q. -- Trial Exhibit 383 for identification.

24 MR. CANTY: I'd like to present it to the witness,  
25 unless you have an objection.

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1           **THE COURT:** Any objection?

2           **MS. McCLOSKEY:** Yes. Objection, Your Honor.

3           **THE COURT:** Objection? What's the rule?

4           **MS. McCLOSKEY:** Foundation.

5           **THE COURT:** All right.

6           Why don't you lay a little foundation.

7           **MR. CANTY:** Sure. May I approach the witness?

8           **THE COURT:** Yes.

9           **BY MR. CANTY:**

10          **Q.** Mr. Satterfield, do you recognize what's been marked as  
11          Exhibit 383 in front of you?

12          **A.** Yes.

13          **Q.** And that is one of those form e-mails that Meta would send  
14          out to an app developer if you believed that they were  
15          violating the business terms tools; correct?

16          **A.** I think it --

17                 **MS. McCLOSKEY:** Objection, Your Honor.

18                 **THE COURT:** He's laying a foundation.

19                 Go ahead.

20                 **THE WITNESS:** I think it's really important to  
21          understand what this -- what this kind of e-mail is.

22          **BY MR. CANTY:**

23          **Q.** Sure.

24          **A.** Like these filters were built to be overbroad; right?

25          They're --

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1 Q. Sir, I'm just asking about the document.

2 A. Well, I -- I think I've got to explain the e-mail; right?  
3 What the e-mail is.

4 Q. I'm just asking you if the e-mail is one of those e-mails  
5 that's sent to an app developer if you believe that they may  
6 have violated your privacy policies.

7 MS. McCLOSKEY: Objection, Your Honor.

8 THE COURT: I'm not ruling on that right now.  
9 Go ahead.

10 THE WITNESS: That's not --

11 THE COURT: Can you answer that?

12 THE WITNESS: Sure.

13 That's not quite what it is. So these filters, when they  
14 are triggered --

15 THE COURT: Let me -- let me just jump in.

16 Right now we're doing something to decide whether the jury  
17 is going to see this, so he's asking you some basic questions  
18 like "Have you seen this before," "Do you recognize it." Other  
19 questions will follow.

20 Let's just do the nuts and bolts.

21 THE WITNESS: Okay.

22 THE COURT: So right now, I believe the question is:  
23 Do you recognize this as a form letter that Meta sent out for  
24 this kind of situation?

25 THE WITNESS: It -- it is the -- the kind of thing

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1 that we would send if the PII filter had been triggered as a --  
2 as an alert to developers.

3 **BY MR. CANTY:**

4 **Q.** Okay. And you have no reason to believe that that's not  
5 an authentic e-mail that was sent out; correct?

6 **A.** No, no reason.

7 **MR. CANTY:** Your Honor, I'd ask for what's been marked  
8 as --

9 **THE COURT:** Well, I mean, I think I'm okay with the  
10 bottom part, but the top part -- I don't think he's involved in  
11 any of that.

12 **BY MR. CANTY:**

13 **Q.** There was a response that you received from Flo Health;  
14 correct.

15 **MR. CANTY:** Your Honor --

16 **MS. McCLOSKEY:** Objection.

17 **THE COURT:** Well --

18 **MR. CANTY:** I'm going to ask to instruct the witness  
19 not to look at counsel table for an answer.

20 **THE COURT:** I'm sure that counsel realizes that if I  
21 ever saw any evidence of signaling, there would be severe  
22 repercussions, so let's just assume that's not happening.

23 I mean, did he get this e-mail?

24 Just look at the top half. And look, we're not trying to  
25 share too much about it until I decide that it's admissible.

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1 Are you on any of that?

2 THE WITNESS: No.

3 THE COURT: No? Okay.

4 BY MR. CANTY:

5 Q. Sir, you previously testified when I asked you that Flo  
6 responded and that you said that's why -- how the system works.  
7 That's the response you're referring to; correct?

8 A. Yes, I've seen -- I saw this document in my deposition.

9 MR. CANTY: Your Honor, I asked --

10 THE COURT: Tell you what. I mean, you can use the  
11 bottom half. Can you blank it out quickly?

12 MR. CANTY: Sure.

13 THE COURT: Just use the bottom half. I think we're  
14 good on that.

15 MR. CANTY: Okay.

16 BY MR. CANTY:

17 Q. So while we're getting that ready, I'm going to ask you --  
18 (Reporter interruption for clarity of the record.)

19 BY MR. CANTY:

20 Q. While they're getting that ready, I'll ask you some  
21 questions about this.

22 So you -- as you sit here today, you understand that you  
23 received a response from Flo Health --

24 THE COURT: One second.

25 MR. CANTY: Yes.

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1           **THE COURT:** The bottom half is admitted.

2           Well, you know what? You're fixing it, so 383 is admitted  
3 pending the fixed version, yeah.

4           Go ahead.

5           (Trial Exhibit 383 received in evidence.)

6           **BY MR. CANTY:**

7           **Q.** You received a response from Flo Health; correct?

8           **A.** Yes.

9           **Q.** And they denied violating your policies; correct?

10          **A.** Yes.

11          **Q.** So who was responsible for rectifying that disconnect?

12          Facebook says we're getting sensitive health information,  
13 Flo Health says, no, we're not.

14          What team, what individual, what officer said, "I will  
15 take responsibility to make sure we're not collecting sensitive  
16 health data and get to the bottom of this"? Who was that?

17          **MS. McCLOSKEY:** Objection, Your Honor.

18          **THE COURT:** Overruled.

19          **THE WITNESS:** I think this is a really important  
20 question, so this is why it's important to --

21          **BY MR. CANTY:**

22          **Q.** That's why I asked it.

23          **A.** Yeah -- understand what this e-mail is; right?

24          This e-mail is not a notice of a violation of our terms.  
25 This is a notice that serves as a kind of reminder for the

1 developer to check to ensure that they are in compliance with  
2 our terms.

3 The filter has been triggered. That's what's leads to  
4 this e-mail being sent. But the filters are overbroad. The  
5 filters can be wrong. This is an alert just letting the  
6 developer know that we saw something and that you should check.

7 And what happened subsequently was there was presumably  
8 some checking and a confirmation that there wasn't a problem.

9 Q. And Facebook -- there was checking by Facebook to make  
10 sure that there was no problem?

11 A. No, the developer checked. The developer is the only one  
12 in the position to -- to make that determination.

13 Q. Well, no. Ultimately, Meta has to make the response --  
14 the determination as to whether or not the information they  
15 actually received is violative of their terms; correct?

16 A. Well, they -- what this is intended to do --

17 Q. I'm not asking about this. I'm asking: Isn't it  
18 Facebook's ultimate responsibility to make sure that the  
19 information they have isn't violating their terms?

20 A. I think our responsibility is to inform advertisers and  
21 developers about their obligations under the terms, and that's  
22 what was happening here.

23 The developers are in the best position to control what  
24 they share with Facebook.

25 Q. The second paragraph here reads -- this is from 383.

## SATTERFIELD - DIRECT / CANTY

1 (as read):

2 "This is a note from the Facebook integrity  
3 team."

4 Incidentally, that integrity team had just been set up;  
5 right?

6 A. I don't remember when the integrity team was set up.

7 Q. I'll tell you it was -- I believe it was December of 2018;  
8 correct?

9 A. I -- I don't remember.

10 Q. You're an officer at Meta responsibility -- who is  
11 responsible for data privacy, and you can't tell us, as you sit  
12 here today, when this robust integrity system that you had was  
13 set up?

14 A. Oh, I'm sorry. You're talking about the system.

15 Q. When was it set up?

16 A. This is the integrity team. I thought you were asking  
17 about --

18 Q. When was the system set up?

19 A. The system was set up in late 2018.

20 Q. And it says (as read):

21 "You are receiving this because your app has  
22 been identified as sending us data that may violate  
23 our business tools terms."

24 Do you see that?

25 A. Yes.

1 Q. And you just testified that it's overbroad; it may be  
2 wrong. So this is essentially meaningless if you can't tell us  
3 that this actually alerts advertisers that they are violating  
4 your rules; correct?

5 A. Well, I think it's very meaningful. It's -- it's an alert  
6 that there may be a problem with the data that you're sending  
7 us?

8 And in -- and in this case, it actually triggered exactly  
9 the response that we would hope, which is the developer -- the  
10 developer checked what they were sending us?

11 So I think it's very meaningful.

12 Q. Wait. So -- so you were satisfied with the fact that  
13 Flo Health checked, told you they weren't sending you any  
14 sensitive health data, and continued to send you data like "get  
15 pregnant," "ovulation" --

16 MS. McCLOSKEY: Objection.

17 BY MR. CANTY:

18 Q. -- "period"?

19 Your testimony is that the system worked while that  
20 continued to happen?

21 MS. McCLOSKEY: Objection, Your Honor.

22 THE COURT: Please don't object during the question.  
23 Everybody, just wait till the question is done. Each side has  
24 been doing this. Just wait 'til the question is done.

25 The objection is overruled.

## SATTERFIELD - DIRECT / CANTY

1 Go ahead.

2 MR. CANTY: And I'm sorry. Could you --

3 THE COURT: Take it from the top.

4 MR. CANTY: Sure.

5 BY MR. CANTY:

6 Q. You testified that this is exactly how the system should  
7 work: You send out an e-mail that may or may not tell an app  
8 developer that they may or may not be violating the rules.  
9 They tell you no. They continue to send you sensitive health  
10 data, and you collect information like "get pregnant,"  
11 "ovulation," "period," and you're saying that's exactly how you  
12 wanted the system to work?

13 A. So, again --

14 MS. McCLOSKEY: Objection.

15 THE COURT: Overruled. Please.

16 THE WITNESS: So, again, what this is describing --  
17 the reason why this notice would have been sent is that the PII  
18 filter was triggered. The PII filter was designed to identify  
19 structured data like Social Security numbers, driver's license  
20 numbers, bank account numbers.

21 And, yes, they check to see whether that information was  
22 being sent. They followed up via e-mail.

23 I think that's a great interaction. That's exactly how we  
24 would have hoped this filtration system would work.

25 \\\

1 BY MR. CANTY:

2 Q. And you were satisfied that -- with that response that you  
3 got from Flo?

4 A. I -- I'm not aware of what -- of the full conversation  
5 that happened afterward, but I -- I think that they resolved  
6 whatever concern triggered this -- this e-mail.

7 Q. Well, they didn't, because another automated e-mail went  
8 out a month later. Were you aware of that?

9 MS. McCLOSKEY: Objection.

10 THE COURT: Overruled.

11 THE WITNESS: I can't remember that one.

12 BY MR. CANTY:

13 Q. Well, who spoke to Flo? What human individual spoke to  
14 somebody at Flo to try to solve this problem of collecting  
15 sensitive health data from women?

16 A. So I'm not sure who exactly would have -- would have had  
17 the conversation. It probably would have been somebody in --  
18 the client partners. I think Flo was a managed company, so  
19 they would have had a client partner that would have talked to  
20 them about our policies.

21 Q. And as you sit here today, you have no idea, one, if that  
22 conversation ever occurred, or, two, who that person was who  
23 would have had that conversation; correct?

24 A. I don't -- no, I wouldn't know that. That --

25 Again, I worked on the public policy team. I didn't work

## SATTERFIELD - DIRECT / CANTY

1 on investigations or interactions with individual developers.

2 THE COURT: Roughly how much more?

3 MR. CANTY: Your Honor, if I could have five minutes,  
4 I could probably --

5 THE COURT: Yes, of course. Go ahead.

6 MR. CANTY: Well, just to organize my notes, and then  
7 I think I have about 10 minutes to go. Is that okay?

8 THE COURT: Why don't we just take a little  
9 five-minute break. Okay? We've got to wrap this witness up  
10 today, so we'll come back in about five minutes.

11 THE COURTROOM DEPUTY: All rise.

12 (The jury leaves the courtroom.)

13 (Proceedings were heard out of the presence of the jury.)

14 (Recess taken at 2:56 p.m.)

15 (Proceedings resumed at 3:09 p.m.)

16 (Proceedings were heard out of the presence of the jury.)

17 THE COURTROOM DEPUTY: All rise.

18 THE COURT: Okay. Let's bring the jury.

19 MR. CLUBOK: Your Honor, one quick update, if I may?

20 THE COURT: Update. Yes.

21 MR. CLUBOK: Yes. We talked to Mr. Satterfield, and  
22 given the importance and given that Mr. Canty -- no fault of  
23 his own, I'm sure -- has gone over his time estimates,  
24 Ms. McCloskey is going to go more --

25 THE COURT: Oh, I'm sorry. Just one second.

## SATTERFIELD - DIRECT / CANTY

1           **MR. CLUBOK:** Anyway, given the importance and that  
2       Mr. Satterfield has -- has agreed to rearrange his plans and be  
3       available to come back on Wednesday, so we don't have to --

4           **THE COURT:** We'll just finish it today.

5                       (The jury enters the courtroom.)

6                       (Proceedings were heard in the presence of the jury.)

7           **THE COURT:** Okay. Go ahead.

8           **MR. CANTY:** May I continue, Your Honor?

9           **THE COURT:** Yes.

10          **MR. CANTY:** Thank you.

11       **BY MR. CANTY:**

12       **Q.** Mr. Satterfield, before, we were talking about the notice  
13       that you -- that Facebook sent out in December of 2019 --  
14       excuse me -- December of 2018, and I asked you if it had been  
15       resolved. You said it had been resolved.

16               And I asked whether or not you were aware of another  
17       notice going out the following month.

18           **MR. CANTY:** I have what's been marked as 536 for  
19       identification. I'd like to present it to the witness.

20               May I approach the witness, Your Honor?

21           **THE COURT:** I'm sorry. What are we doing?

22           **MR. CANTY:** This is Exhibit 536 for identification.

23           **THE COURT:** Oh, sure, yes.

24               I don't think I have that.

25           **MR. CANTY:** I have a copy here.

## SATTERFIELD - DIRECT / CANTY

1           **THE COURT:** Just hand it to Ms. Clark.

2           Okay.

3           **MS. McCLOSKEY:** You said 536. This is --

4           **MR. CANTY:** 652. I apologize. I said it wrong.

5           **THE COURT:** Yes, 652, yes. 6-5-2.

6           **MR. CANTY:** No, I'm sorry. It's --

7           **THE COURT:** I have 652.

8           **MR. CANTY:** Okay. That is not what I was intending to  
9 introduce, Your Honor.

10          **THE COURT:** All right. Why don't you hand that back  
11 to --

12          **MR. CANTY:** It's the January e-mail.

13          **THE COURT:** Thank you.

14          **MS. McCLOSKEY:** That's 536.

15          **MR. CANTY:** 536. So I was right, 536.

16          **THE COURTROOM DEPUTY:** The Court still needs a copy.

17          **MR. CANTY:** Yes.

18          **THE COURT:** Okay.

19          **MR. CANTY:** I need to get a copy for the witness. Can  
20 we just have it shown so the witness --

21          **THE COURT:** Yes.

22          **MR. CANTY:** -- electronically?

23          **THE COURTROOM DEPUTY:** Wait a minute before he does  
24 that.

25          Okay.

## SATTERFIELD - DIRECT / CANTY

1 BY MR. CANTY:

2 Q. Do you see that, Mr. Satterfield?

3 A. I do.

4 Q. And does this -- who was that from?

5 A. This is from Facebook.

6 Q. And what's the date on that?

7 A. It's dated January 6th, 2019.

8 Q. Okay. And this is regarding a notice that was sent out  
9 regarding a potential violation from the Facebook integrity  
10 team?

11 A. Yes. This would have been a PII filter notification.

12 Q. Similar to the one we saw before?

13 A. Yes.

14 MR. CANTY: Your Honor, I ask for what's been marked  
15 as Trial Exhibit 536 for identification be moved into evidence.

16 THE COURT: Any objection?

17 MS. McCLOSKEY: No objection.

18 THE COURT: Okay. It's admitted.

19 (Trial Exhibit 536 received in evidence.)

20 BY MR. CANTY:

21 Q. So we now come to the end of February of 2019, and you --  
22 we have concerns about reporting that you may be collecting  
23 sensitive health data from Flo Health app users.

24 Who did you alert above you? Who were you reporting to?  
25 Did you -- did you alert that there was a concern about

## SATTERFIELD - DIRECT / CANTY

1 negative press regarding the collection of this sensitive  
2 health data?

3 MS. McCLOSKEY: Objection, Your Honor.

4 THE COURT: Overruled.

5 THE WITNESS: Well, I think I would have talked to my  
6 manager and potentially her manager.

7 BY MR. CANTY:

8 Q. Did you let Mark Zuckerberg know that there was an  
9 allegation that you were potentially collecting sensitive  
10 health data --

11 MS. McCLOSKEY: Object --

12 BY MR. CANTY:

13 Q. -- from women?

14 MS. McCLOSKEY: Objection, Your Honor.

15 THE COURT: Overruled.

16 THE WITNESS: I can't remember having any  
17 conversations with -- with Mark, no.

18 BY MR. CANTY:

19 Q. Would this have been something that would have been  
20 important for him to know?

21 A. I think, considering the number of inquiries that we got,  
22 yes, it would have been important for him to know.

23 Q. And do you know if anybody brought this to his attention  
24 in February of 2019, that there was an allegation that you were  
25 collecting sensitive health data from women?

## SATTERFIELD - DIRECT / CANTY

1   **A.**    I -- I don't.  I was many levels down from the CEO at that  
2   point.  I -- I probably wouldn't have known whether there had  
3   been a communication to Mr. Zuckerberg.

4   **Q.**    Okay.  And the -- we talked about the health data filter.  
5   That was established after the class period in December of  
6   2019; correct?

7   **A.**    Yes.

8   **Q.**    Were you aware that there were individuals at Facebook  
9   raising concerns as early as May of 2018 that advertisers were  
10  either inadvertently or intentionally sending sensitive  
11  information, including health information, in custom data  
12  fields via the SDK?

13  **A.**    I know that this is something that we considered as a  
14  risk, and that is why we developed the policy around it.  And  
15  so I'm sure that there were people talking about this as a risk  
16  and what we could do to mitigate that risk.

17  **Q.**    So you agree that as early as May of 2018, Meta knew that  
18  you were potentially collecting sensitive health data through  
19  the SDK from users?

20  **A.**    Well, I don't -- I don't think that's quite the same  
21  thing.  I -- I -- what I would say is that we have folks who  
22  specialize in risk management.  Right?  They -- they -- their  
23  job is to think about ways in which our products could be  
24  misused and to think of ways to mitigate that misuse to prevent  
25  that from happening.

## SATTERFIELD - DIRECT / CANTY

1 And so I -- I'm sure that there were people who were  
2 thinking about this product and the potential risks associated  
3 with that product. I think the policy is evidence of that.

4 Q. And despite that fact that as early as May of 2018, the  
5 health integrity system was never put in place until December  
6 of 2019; correct?

7 A. The -- the health data filtering system was put in place,  
8 yes, in late 2019.

9 Q. Now --

10 THE COURT: So we took a five-minute break --

11 MR. CANTY: Yup. I've got two more questions.

12 THE COURT: All right.

13 MR. CANTY: Thank you. I appreciate it.

14 THE COURT: Yes.

15 BY MR. CANTY:

16 Q. You said that -- that you take data privacy very  
17 seriously; correct?

18 A. Yes, I do.

19 Q. And you would agree with me that sensitive health data is  
20 probably the area that you should take most seriously, correct,  
21 when it comes to data privacy?

22 A. I think it's definitely one of them, yes.

23 Q. You don't think it's something to joke about, do you?

24 A. Well, I -- I think it's something that we take extremely  
25 seriously, yes.

1 Q. Well, were you aware that when there was blowback on these  
2 potential articles that employees at Facebook were joking about  
3 being the keepers of people's menstrual cycles and ovulation  
4 data?

5 A. Look, I -- I think that this was a stressful period for a  
6 lot of people who worked at Facebook. These -- there were a  
7 lot of inquiries. And, you know, sometimes people in stressful  
8 situations joke about those situations. So I'm sure that that  
9 happened.

10 Q. And, in fact, when somebody said "I'm the keeper of  
11 everyone's ovulation and menstruation data," somebody  
12 responded, "Wow, that's such a great gig," words to that  
13 effect; correct?

14 A. I -- I think you're referring to a document which should  
15 be -- I think you're talking about a document that I saw in my  
16 deposition.

17 Q. Well, does -- what would you -- would you like to look at  
18 it to refresh your recollection as to what was actually said?

19 A. I think that's -- that would be helpful.

20 MR. CANTY: Sure.

21 I have what's been marked as Trial Exhibit 652.

22 THE COURT: Well, you're just using it for  
23 refreshment; right?

24 MR. CANTY: Yes.

25 THE COURT: Yeah, that's fine.

## SATTERFIELD - DIRECT / CANTY

1           **THE WITNESS:** Okay.

2           **BY MR. CANTY:**

3           **Q.** Does that refresh your recollection --

4           **A.** Yes.

5           **Q.** -- with respect to somebody saying in response to "Yep,  
6 I'm the keeper of everyone's ovulation and menstruation data,"  
7 somebody saying, "That's quite a gig," to which another  
8 employee responded, "May the flow be with you"?

9           **A.** These were --

10          **Q.** I'm asking if that's -- if that's what your recollection  
11 of what was said.

12          **A.** That's what the document says. This was a chat among  
13 members of the communications team. They were asking who was  
14 working on the Wall Street Journal article. It was a stressful  
15 situation. People made inappropriate jokes.

16               But I -- I think that this is something that often  
17 happens. This is sort of an interoffice thing.

18               But I also think it reflects how sensational those  
19 allegations were in the Journal article.

20          **Q.** Did you find this funny?

21          **A.** I personally don't find it funny.

22          **Q.** Did you discipline the individuals that were making these  
23 comments about woman's private health data --

24          **A.** Well, I -- I hadn't --

25               **MS. McCLOSKEY:** Objection.

1           **THE WITNESS:** -- seen that chat before my deposition.

2       I wasn't on it or aware of it.

3       **BY MR. CANTY:**

4       **Q.**    Since you saw it at your deposition, have you taken any  
5       action --

6           (Reporter interruption for clarity of the record.)

7       **BY MR. CANTY:**

8       **Q.**    Since your deposition, have you taken any action with  
9       respect to what you read at your deposition?

10       **MS. McCLOSKEY:**  Objection.

11       **THE COURT:**  Overruled.

12       **THE WITNESS:**  No.  I -- this is an employee who was  
13       making a joke in a time of extreme stress.  I -- I don't know  
14       what action we would take.

15       **BY MR. CANTY:**

16       **Q.**    You don't know what action you'd take?  Was there any  
17       remedial action to talk to them about appropriate e-mail  
18       content?

19       **A.**    I -- you know, look.  That -- that's not something that I  
20       would do in the course of my -- this is the communications  
21       team.

22           Look, I think, again, this was a very stressful time.  We  
23       did take this extremely seriously.  I took it extremely  
24       seriously.  This was an unfortunate joke that someone made.

25       **Q.**    Well, it wasn't just one person; correct?  It was three

## SATTERFIELD - DIRECT / CANTY

1 individuals in the chat; right?

2 **A.** It -- it was a -- it was a chat among our communications  
3 team. It was a stressful situation, and oftentimes people joke  
4 in those situations. I don't find it funny.

5 **MR. CANTY:** May I have Trial Exhibit 50, please.

6 **BY MR. CANTY:**

7 **Q.** Were you aware that Flo Health actually sent an e-mail to  
8 the users of the Flo Health app essentially explaining what  
9 data they had shared with Meta? Were you aware of that?

10 **A.** No.

11 **Q.** Okay. And that was sent on July 2nd, 2021.

12 Do you see that?

13 **MS. McCLOSKEY:** Excuse me. Counsel, do you have  
14 copies of this --

15 **MR. CANTY:** This is this evidence.

16 **MS. McCLOSKEY:** Do you have copies of it?

17 **MR. CANTY:** It's already been --

18 **THE COURT:** Please. I'm the only person -- I  
19 really --

20 You know, if it happens again, people are going to have to  
21 leave.

22 What is the issue?

23 **MR. CANTY:** Trial Exhibit 50 is on the screens. They  
24 were asking for a hard copy. I didn't come with a hard copy.

25 **THE COURT:** Don't just blurt out "Give me a hard copy"

1 during an exam.

2 Go ahead.

3 MR. CANTY: Thank you, Your Honor.

4 BY MR. CANTY:

5 Q. Can you take a look at Trial Exhibit 50, please.

6 A. Yes, I see it.

7 Q. Did Meta ever send an apology note or e-mail to the users  
8 for whom you collected sensitive health data without their  
9 permission?

10 A. Well, again, I -- I don't -- I don't quite agree with the  
11 premise of your question. I don't know that there -- that  
12 we -- we actually did collect sensitive information, as you  
13 describe it.

14 Did we send an e-mail like this? Not that I'm aware of.

15 Q. Have you ever apologized to the women whom you collected  
16 this information from without their permission?

17 A. I don't know that we did collect those women's information  
18 with or without their permission.

19 MR. CANTY: No further questions, Your Honor.

20 THE COURT: Okay. Pass the witness.

21 CROSS-EXAMINATION

22 MS. McCLOSKEY: May I approach, Your Honor?

23 THE COURT: Approach the witness? Yes.

24 BY MS. McCLOSKEY:

25 Q. Good afternoon, Mr. Satterfield.

1     **A.**    Good afternoon.

2     **Q.**    Prior to February of 2019, when the Wall Street Journal  
3     was published, had you ever heard that Meta -- that Facebook  
4     had received any sensitive health information from Flo from the  
5     Flo app?

6     **A.**    No, I had not.

7     **Q.**    Now, looking back after all the evidence you've seen and  
8     the deposition, have you seen any evidence at all that Facebook  
9     received any sensitive health information from the Flo app?

10    **A.**    No.

11    **Q.**    If Flo had indeed sent sensitive health information to  
12    Facebook, would that have violated the contractual agreement  
13    that was entered into between Facebook and Flo?

14    **A.**    Yes. All developers promise not to send sensitive health  
15    information. Yes.

16    **Q.**    You testified during counsel's examination about policies,  
17    and I want to look at those contractual agreements that  
18    Facebook enters into with every developer that uses the  
19    software development kit.

20           And just to be clear, can any developer share data with  
21    Facebook without entering into a contractual agreement with  
22    Facebook?

23    **A.**    No. They -- they first have to agree to the agreement we  
24    call the business tools terms.

25    **Q.**    Let's look at those contractual agreements.

## SATTERFIELD - CROSS / McCLOSKEY

1 Please take a look at Trial Exhibit 1256.

2 MS. McCLOSKEY: And this exhibit has been agreed to,  
3 Your Honor.

4 THE COURT: Is it admitted?

5 MS. McCLOSKEY: Yes. We've agreed to admit it.

6 THE COURT: Okay. 1256 is admitted.

7 (Trial Exhibit 1256 received in evidence.)

8 BY MS. McCLOSKEY:

9 Q. What is Exhibit 1256?

10 A. This is a -- a compilation of versions of the platform  
11 policy that were in place between roughly 2015 and 2019.

12 Q. Is this one of the contractual agreements entered into  
13 between Facebook and any app developer that wants to share data  
14 with Meta?

15 A. Yes. A developer first has to create a developer account,  
16 and a condition of creating that account is to accept, to agree  
17 to, the platform policies.

18 Q. I'm going to direct your attention to -- to the last page  
19 of the -- of Tab B in this Exhibit 1256 B.

20 And can you tell me when this version of Facebook's  
21 platform policy was last updated, when it became effective?

22 MS. McCLOSKEY: Scott, would you mind bringing that  
23 date up, please.

24 BY MS. McCLOSKEY:

25 Q. And you can see -- there we go. Scott has made it big for

1 you on the screen.

2 What was this version of Facebook's platform policy last  
3 updated?

4 A. May 26, 2016.

5 Q. Let's take a look at the section on page 14 of this  
6 exhibit under the header "Give People Control."

7 And I'll have you look at paragraph 11, which is on the  
8 next page of this.

9 Can you please read for the jury the first paragraph of  
10 provision 11 in Facebook's platform policy?

11 A. Yes. It says (as read):

12 "Obtain adequate consent from people before  
13 using any Facebook technology that allows us to  
14 collect and process data about them, including, for  
15 example, our SDKs and browser pixels."

16 Q. What does this provision of the platform policy require  
17 app developers to do before they share any data with Facebook?

18 A. It requires them to get adequate consent. So they would  
19 need to inform their users that this data could be transmitted  
20 from their app and obtain an agreement from those users.

21 Q. There are five versions of the platform policy in this  
22 Exhibit 1256.

23 Do you see that on the -- the cover page there?

24 A. Yes.

25 Q. Is this same paragraph in every version of the platform

1 policy included in this compilation exhibit,  
2 Trial Exhibit 1256?

3 **A.** Yes, it is.

4 **Q.** Between 2016 and 2019, in addition to this agreement, the  
5 platform policy, were developers also required to enter into  
6 another agreement with Facebook before they could share any  
7 data at all with Facebook?

8 **A.** Yes.

9 **Q.** What was the name of that agreement?

10 **A.** So the agreement's name changed during the period that  
11 we're talking about. It was originally called the terms for  
12 conversion tracking, and it had a long name, but I think we  
13 referred to it as the terms for conversion tracking.

14 That document was later called the business tools terms.

15 (Reporter interruption for clarity of the record.)

16 **THE WITNESS:** Business tools terms.

17 I should bring the mic closer.

18 **BY MS. McCLOSKEY:**

19 **Q.** When in the process of integrating the software  
20 development kit with their own code did developers agree to  
21 Facebook's tools for conversion tracking, later called the  
22 business tools terms?

23 **A.** So it would have been before they were able to start  
24 sending data to Facebook.

25 **Q.** Was it possible for a developer to share any data with

## SATTERFIELD - CROSS / McCLOSKEY

1 Facebook before they entered into the agreement with Facebook,  
2 the business tools terms?

3 **A.** No. They had to enter that the agreement.

4 **Q.** Let's take a look at Trial Exhibit 1223.

5 **MS. McCLOSKEY:** And, again, the parties have agreed to  
6 admit this exhibit.

7 **THE COURT:** Okay. 1223 is admitted.

8 (Trial Exhibit 1223 received in evidence.)

9 **BY MS. McCLOSKEY:**

10 **Q.** Mr. Satterfield, what is Exhibit 1223?

11 **A.** This is a -- a compilation of the terms that I just  
12 described, the terms for conversion tracking, which we later  
13 called the business tools terms.

14 **Q.** And these are the versions of the terms for conversion  
15 tracking and the business tools terms that were in effect in  
16 the class period in this case between 2016 and 2019; is that  
17 correct?

18 **A.** That's correct.

19 **Q.** Okay. I am going to have you look at the second version  
20 of the -- of the terms for conversion tracking first, and I'll  
21 have you take a look at the top of the tab -- the first page of  
22 Tab B.

23 **MS. McCLOSKEY:** If you could pull that up, Scott.

24 **BY MS. McCLOSKEY:**

25 **Q.** When was this version of the tools for conversion tracking

1 in effect with -- between all developers that wanted to share  
2 data with Facebook?

3 A. As of May 26, 2016.

4 Q. Okay. I'm going to direct your attention to Section C in  
5 the middle of page 4, and I'll have that pulled up on your  
6 screen.

7 Can you please read to the jury the first paragraph under  
8 C that we've highlighted here for you on your screen.

9 A. (as read):

10 "You agree and confirm that you have provided  
11 robust and sufficiently prominent notice to and  
12 obtained necessary consent from your users regarding  
13 the event data collection sharing and usage enabled  
14 by your use of the Facebook tools."

15 Q. Mr. Satterfield, what did this paragraph in the agreement  
16 between Facebook and developers require any developer to do  
17 before sharing any data at all with Facebook?

18 A. So this is -- this is about providing notice. It's an  
19 important privacy principle that people understand how you're  
20 going to collect, use, and share their data.

21 And what this -- what this requirement specifies is that  
22 you should have a notice that informs people about those things  
23 before you start sending event data to Facebook.

24 Q. Thank you.

25 Let's take a look at paragraph 2 just below this. Will

1 you please read that paragraph to the jury.

2 And I'll just remind you to read it slowly so the court  
3 reporter can get everything down.

4 **A.** Thanks. (as read):

5 "For apps, a clear and prominent link that is  
6 easily accessible inside your app settings or any  
7 privacy policy -- or any privacy policy and from  
8 within any store or website where your app is  
9 distributed that links to a clear explanation, A,  
10 that third parties, including Facebook, may collect  
11 or receive information from your app and other apps  
12 and use that information to provide measurement  
13 services and targeted ads; and, B, how and where  
14 users can opt out of the collection and use of  
15 information for ad targeting."

16 **Q.** Can you please explain to the jury what the purpose of  
17 this paragraph was in the agreement between Facebook and  
18 developers?

19 **A.** Yes. This -- this specifies the notice requirement, and  
20 so the -- the first part of this section says that you need to  
21 have a notice. This describes for apps what that notice should  
22 look like and where it should be.

23 And it's important to note that we require that apps call  
24 out Facebook specifically. We don't just require that they say  
25 that their SDK is being used in the app; they have to say

1 Facebook.

2 And the second thing I think that's important here is that  
3 we would require the developer to tell people where they could  
4 opt out of the use of this event data for ad targeting. We  
5 offer an opt-out for that, so people can choose to -- whether  
6 to have -- the information that is shared about them by an app  
7 developer, they can choose whether that can be used for ad  
8 targeting back on Facebook and Instagram.

9 **Q.** I think that last thing you explained is particularly  
10 important, and I want to make sure it's clear.

11 How does it work for users to opt out of the collection  
12 and use of any data if they so choose?

13 **A.** So when I was speaking with the gentleman before, I  
14 described two reasons or two ways in which we can use event  
15 data for ads.

16 One is through what we call custom audiences, which is  
17 where an app developer tells us: I'd like to show this list of  
18 folks ads back on Facebook and Instagram.

19 And there was a second way, which is that this information  
20 can generally be used to improve the machine learning system  
21 that helps us deliver relevant ads to people.

22 If you were to opt out and tell us, "I don't want to see  
23 ads based on this event data," neither of those things would  
24 have happened for you. You wouldn't have seen ads that were  
25 informed by this kind of data.

## SATTERFIELD - CROSS / McCLOSKEY

1 Q. I'm going to now direct your attention to paragraph D of  
2 this contract, and we'll pull that up on the screen.

3 Can you please read paragraph (D) to the jury. And this  
4 is a paragraph that we've heard quite a lot about in this case  
5 so far.

6 A. Yes. It says (as read):

7 "You agree not to transfer or disclose any  
8 personally identifiable information to Facebook or  
9 combine any information obtained in connection with  
10 these terms with personally identifiable information.  
11 You further agree that you will not share with us  
12 information that you know or reasonably should know  
13 is from or about children under the age of 13 or that  
14 includes health, financial, or other sensitive" --  
15 I'm sorry -- "other categories of sensitive  
16 information, including any information defined as  
17 sensitive under applicable law."

18 Q. Mr. Satterfield, why does Facebook include in its  
19 contractual agreement with developers this provision about what  
20 types of data developers may not send to Facebook?

21 A. So just -- just to step back, we consider these kinds of  
22 questions all the time at the company we now call Meta.  
23 They're privacy questions, and we ask really two questions:  
24 One, is there value in us using this data on behalf of the  
25 people who use our services? Is there value that -- that we

1 could -- is there value to the users of our services in using  
2 this data?

3 And the second question that we ask is: Are there risks  
4 associated with using this data?

5 Right here, the answer was we didn't see a lot of value.  
6 Right? We didn't see a lot of value in having people's Social  
7 Security numbers, which is the kind of information that could  
8 have been covered by these terms. We don't see a lot of value  
9 in having people's health data.

10 And we do see risk. It's risky to have people's Social  
11 Security numbers. What if, you know, God forbid, there's a  
12 breach? That's extremely sensitive information that can be  
13 used to harm a person if it gets into the hands of the wrong  
14 person. We don't want that data in the first place, and we  
15 don't want health data.

16 And ultimately, it's about -- the risk here is really  
17 about violating the trust of the people who use our services.  
18 They don't want us to have this data. They don't want us to  
19 receive it from apps that could send it to us.

20 And so we made the decision to put a policy in place that  
21 told developers not to send it to us.

22 Q. Counsel asked you some questions about the money that  
23 Facebook makes from advertising.

24 Are there situations where Facebook decides that any  
25 revenue it would receive is not worth the risk that it violates

1 users' trust?

2 **A.** Yes, absolutely. Users' trust is fundamental to our  
3 services. It's fundamental to the success of the company.

4 If people don't trust us, they're not going to use  
5 Facebook. They're not going to use WhatsApp or Instagram or  
6 Threads. Violating that trust damages our business, and it's  
7 just not the way that we want to operate the company.

8 **Q.** Are these provisions that we just looked at regarding  
9 developers providing notice to their users that they're sharing  
10 data with Facebook and agreeing not to share health information  
11 or other categories of sensitive information in every version  
12 of Facebook's conversion terms, its agreement with developers,  
13 included in this compilation exhibit that you're looking at  
14 now?

15 **A.** Yes, they're in all of them.

16 **Q.** The compilation -- we -- also includes the business tools  
17 terms. That's the version -- the updated version of the terms  
18 for conversion tracking entered into in 2018; correct?

19 **A.** Yes.

20 **Q.** Does your description of how a developer is presented with  
21 the terms for conversion tracking also apply to how they're  
22 presented with the business tools terms?

23 **A.** Yes.

24 **Q.** Okay. Mr. Satterfield --

25 And those two provisions regarding notice and not sharing

1 health information and other types of sensitive information --  
2 is that same language included in the business tools terms that  
3 Facebook released in 2018?

4 **A.** Yes, it is.

5 **Q.** Mr. Satterfield, you understand, of course, that Flo is a  
6 party to this case; right?

7 **A.** I do.

8 **Q.** And this may be an obvious question, but would Flo have  
9 had to agree to Facebook's terms for conversion tracking and  
10 business tools terms before sharing any data at all with  
11 Facebook?

12 **A.** Yes, they would have had to agree to these terms.

13 **Q.** Does that mean that Flo promised Facebook in a contractual  
14 agreement that it would not send any sensitive information,  
15 including health information, to Facebook?

16 **A.** Yes, exactly. That's what that would have meant.

17 **Q.** Mr. Satterfield, over and above the business tools terms,  
18 has Facebook taken other actions, other precautions, to prevent  
19 developers from sending it sensitive data?

20 **A.** Yes. And there are a number of these. In the earlier  
21 period, as I was saying before, our focus was on educating  
22 developers about their obligation under our terms. The policy  
23 itself is a form of education?

24 Other education may have happened through trainings or  
25 direct client contact or contact with the client partner, if

1 the developer happened to be managed; that is, if they had a  
2 direct contact within Facebook.

3 Later, we built filtering systems, which I was describing  
4 before. The first one that we built was for personally  
5 identifiable information, stuff like Social Security numbers,  
6 and then eventually we built one that was focused on health  
7 data.

8 Q. And as of today, does Facebook have even more systems in  
9 place beyond the PII filter and the health filter to prevent  
10 the receipt of any sensitive data, including health data?

11 A. Yes. We've continued to iterate on these kinds of things,  
12 and we've built additional systems, and we've built out the  
13 systems that we have?

14 And so, for example, we now have a financial data  
15 filtration system. We've expanded the health data filtration  
16 system consistently over the years, which is -- it's a common  
17 thing at the company to just sort of -- we call "iteration,"  
18 but it's a constant desire to improve the systems. And I've  
19 seen that with these systems.

20 Q. In 2018 and 2019, did Facebook employ individuals whose  
21 responsibility it was to identify privacy risks and to build  
22 mitigations to prevent against the receipt of any sensitive  
23 data?

24 A. Yes, we did. We had a large -- we had a large team.

25 Q. Between 2016 and 2019 what did Facebook do with the data

1 the developers sent to it after those developers had integrated  
2 the software development kit into their apps?

3 **A.** So -- so I think three basic things, two of which I've  
4 talked to already, but the -- the first thing would have been  
5 that we would have provided the developer analytics reports.  
6 Right? And these are sort of dashboards of statistics about  
7 actions that people are taking within your app and some general  
8 demographic information about those people.

9 And so a developer is, you know, probably going to want to  
10 know the genders, the general genders of people that have been  
11 using their apps, the general age ranges of people who have  
12 been using their apps. My app happens to be popular with  
13 people 25 to 34. The general location, very popular in the  
14 United States, not as popular in Spain.

15 That kind of information would have been available through  
16 a product that we called Facebook Analytics, and that would  
17 have been made possible by developers sending us -- sending us  
18 information about actions that were happening within their  
19 apps. So that's Facebook Analytics.

20 The second use that we would have made of this kind of  
21 data is what we call custom audiences, and I described this a  
22 bit ago. But, again, that's -- that's an -- an app developer  
23 telling us, I would like to reach this set of folks. Perhaps  
24 it's a set of folks who have taken a particular action within  
25 their app. Maybe it's people who have bought something. They

1 can -- they can send us an event -- right? -- which reflects an  
2 activity that has happened in the app when a person buys  
3 something.

4 If a person buys something in an e-commerce app, that  
5 might suggest to you, as an app developer, that that person  
6 might be interested in other things that I have for sale. I'd  
7 like to go and reach those folks back on Facebook and Instagram  
8 with ads. That's custom audiences.

9 And then the last thing that we talked about was sort of  
10 general improvement of the advertising system, and by general  
11 improvement of the advertising system, what we really mean is  
12 making the advertising system better at showing the most  
13 relevant ad to the person who happens to be looking at Facebook  
14 or Instagram in any given moment, the ad that's going to be  
15 most interesting to them.

16 And by observing activities that developers send us and  
17 having activities on Facebook and Instagram, we can make  
18 predictions about which kinds of ads a particular user might be  
19 interested in. If you're a person that -- that --

20 **THE COURT:** Okay. We need to ask -- this is getting  
21 too narrative. Ask some questions, please.

22 **THE WITNESS:** Okay. Sorry.

23 **BY MS. McCLOSKEY:**

24 **Q.** Is there a particular kind of business for which Facebook  
25 advertising is particularly helpful?

1     **A.**     Small businesses. They represent the overwhelming number  
2     of our advertising clients.

3     **Q.**     And why are Facebook advertisements particularly helpful  
4     to small businesses?

5     **A.**     Because Facebook enables you to reach not only a large  
6     number of people, but a large number of people who are likely  
7     to be interested in what you're selling, and so you can  
8     advertise very efficiently. And so you can spend 50 or \$75 and  
9     reach thousands of people, and those aren't just any thousands  
10    of people; those are people who we believe will be interested  
11    in what you are offering through the ad.

12    **Q.**     Does making money for -- making money through advertising  
13    help Facebook provide services to its users?

14    **A.**     Yes. Advertising is what supports Facebook, Instagram,  
15    Threads, Messenger, WhatsApp. These services are offered for  
16    free, but they're not free to offer. They require massive  
17    amounts of data processing power, data centers, the world's  
18    most talented engineers. All of that costs money.

19           And we're able to fund those efforts and to offer those  
20    apps for free to people because of the revenue that we make  
21    through advertising.

22    **Q.**     Mr. Satterfield, does Facebook also enter into agreements  
23    with people that use its platforms like Facebook and Instagram?

24    **A.**     Yes, we do.

25    **Q.**     And does Facebook provide those users ways to protect

1 their own privacy?

2 **A.** Yes, we do.

3 **Q.** What are some of the ways a user can control and protect  
4 their own data on Facebook?

5 **A.** Well, you know, the best example and an example that's  
6 most familiar to people is that you can control who you share  
7 with when you use Facebook or Instagram. I mean, many of you  
8 will have used Facebook, and you've shared a picture or a post  
9 and you've shared it only with your friends. That's an  
10 audience selection control. That's probably the best known  
11 privacy control.

12 But you can also -- as I was saying before, you can also  
13 control the use of data like event data for advertising  
14 purposes, and you can also control the storage of that data  
15 with your account.

16 And I just want to explain what that is quickly if I  
17 could.

18 We have a control called "off-Meta technologies." It used  
19 to be called "off-Facebook activity." And what that control  
20 does is it allows a person to say --

21 **MR. CANTY:** Objection, Your Honor. This has gone --

22 **THE COURT:** Let's ask a question.

23 **MS. McCLOSKEY:** Sure.

24 **BY MS. McCLOSKEY:**

25 **Q.** When a user signs up for Instagram or Facebook, are they

1 presented with Facebook's terms of use for its platform?

2 A. Yes, they are.

3 Q. Does every user of Facebook or Instagram need to agree to  
4 this, to these terms, before using Facebook or Instagram?

5 A. Yes, they do.

6 Q. Does Facebook get users' consent to receive and use any  
7 data about these users?

8 A. Yes. Yes, and we would get consent to use the event data  
9 that we've been talking about.

10 Q. How does -- how does Facebook get that consent?

11 A. So when you sign up for a Facebook account or an Instagram  
12 account, you're presented with the privacy policy and terms of  
13 use. You need to agree to those things in order to proceed  
14 with account creation. And it's in those documents that we  
15 explain how we receive and use event data.

16 Q. Let's take a look at Trial Exhibit 1224.

17 MS. McCLOSKEY: And the parties have also agreed to  
18 the admissibility of this exhibit.

19 THE COURT: Okay. 1224 is admitted.

20 (Trial Exhibit 1224 received in evidence.)

21 BY MS. McCLOSKEY:

22 Q. What is Exhibit 1224?

23 A. This is a compilation of our terms of service, which we  
24 used to call the statement of rights and responsibilities.

25 Q. And are these the terms of service or the statement of

1 rights and responsibilities that were in effect during the  
2 class period in this case, between 2016 and 2019?

3 **A.** Yes, they were.

4 **Q.** Okay. Let's take a look at the version that was entered  
5 into -- that was last revised on January 30th, 2015.

6 What is this document that we're looking at right now,  
7 Mr. Satterfield?

8 **A.** This is the statement of rights and responsibilities.  
9 It's our terms of service that took effect on January 30th,  
10 2015.

11 **Q.** Okay. I'm going to direct your attention to Section 1  
12 under Privacy.

13 **MS. McCLOSKEY:** And I'll ask, Scott, if you wouldn't  
14 mind pulling up the section under Privacy.

15 **BY MS. McCLOSKEY:**

16 **Q.** Mr. Satterfield, will you please read paragraph 1 of the  
17 statement of rights and responsibilities to the jury.

18 **A.** Yes. It says (as read):

19 "Your privacy is very important to us. We  
20 designed our data policy to make important  
21 disclosures about how you can use Facebook to share  
22 with others and how we collect and can use your  
23 content and information. We encourage you to read  
24 the data policy and to use it to help you make  
25 informed decisions."

1 Q. Were there earlier versions of Facebook's statement of  
2 rights and responsibilities that were released prior to this  
3 one, prior to January 30th, 2015?

4 A. Yes, there were.

5 Q. And just to be clear, prior to 2015, at all times a  
6 Facebook user had to agree to either the Facebook statement of  
7 rights and responsibilities or terms of service?

8 A. Yes.

9 Q. Okay. Let's take a look at Exhibit 1226.

10 MS. McCLOSKEY: And, again, the parties have agreed to  
11 the admissibility of this exhibit.

12 THE COURT: It is admitted.

13 (Trial Exhibit 1226 received in evidence.)

14 BY MS. McCLOSKEY:

15 Q. Mr. Satterfield, what is Exhibit 1226?

16 A. This is a compilation of documents that are called data  
17 policies. These are our privacy policies that were in effect  
18 during these time periods.

19 Q. Okay. Let's take a look at page 2 of the exhibit. It's  
20 Tab A.

21 And can you let the jury know when this was -- when this  
22 version of the data policy was last updated?

23 A. It was January 30th, 2015.

24 Q. Okay. Let's take a look at the bottom of this same page  
25 under the header "What kinds of information do we collect?"

1 I guess it's at the top of this page.

2 A. Okay.

3 Q. Okay. Can you read to the jury -- if we go down, there's  
4 a paragraph called "Information from websites and apps that use  
5 our services."

6 Will you please read this paragraph to the jury.

7 A. Yes. It says (as read):

8 "We collect information when you visit or use  
9 third-party websites or apps that use our services,  
10 like when they offer our Like button or Facebook  
11 log-in or use our measurement and advertising  
12 services. This includes information about the  
13 websites and apps you visit, your use of our services  
14 on those websites and apps, as well as information  
15 the developer or publisher of the app or website  
16 provides to you or us."

17 Q. Thank you.

18 Let's take a look at page 3 of this document under the  
19 header "How do we use this information?"

20 Is this the provision that all Facebook users agree to  
21 that allows Facebook -- that gives Facebook consent to use the  
22 data it receives from apps in its advertising systems?

23 A. Yes.

24 Q. And let's pull out --

25 MS. McCLOSKEY: Thank you, Scott.

1 BY MS. McCLOSKEY:

2 Q. Would you read to the jury, please, "Show and measure ads  
3 and services."

4 A. Yes. (as read):

5 "We use the information we have to improve our  
6 advertising and measurement systems so we can show  
7 you relevant ads on and off our services and measure  
8 the effectiveness and reach of ads and services.  
9 Learn more about advertising on our services and how  
10 you can -- and how you can control how information  
11 about you is used to personalize the ads you see."

12 Q. Mr. Satterfield, why does Facebook disclose to its users  
13 that it both collects data, that it receives data, and that it  
14 uses that data to improve its advertising and measurement  
15 services and to show advertisements?

16 A. It's a foundational principle of privacy that people  
17 should understand how their data is collected, used, and  
18 shared, and that's a core value of ours, and that's why these  
19 disclosures appear in the privacy policies we've written.

20 Q. Okay. And let's take one more look at a paragraph in this  
21 document, the two lines below --

22 MS. McCLOSKEY: Scott, I think if you can pull up the  
23 next. Thank you.

24 BY MS. McCLOSKEY:

25 Q. Will you please read this last paragraph of the data

1 policy to the jury.

2 A. Yes. It says (as read):

3 "Please review your advertising preferences to  
4 understand why you're seeing a particular ad on  
5 Facebook. You can adjust your ad preferences if you  
6 want to control and manage your ad experience on  
7 Facebook."

8 Q. Thank you.

9 MS. McCLOSKEY: You can take that down, Scott.

10 BY MS. McCLOSKEY:

11 Q. Was Facebook's data policy updated over time?

12 A. Yes, it was.

13 Q. Okay. Let's take a look at one more version of Facebook's  
14 data policy, and I'll turn to the version that was last revised  
15 on April 19th, 2018.

16 MS. McCLOSKEY: Thank you.

17 BY MS. McCLOSKEY:

18 Q. Let's take a look at page 21 of this exhibit where --  
19 there we go. And this, again, is -- the date of last revision  
20 is April 19, 2018.

21 Do you see that?

22 A. Yes.

23 Q. Okay. Now let's look at page 14 of the data policy under  
24 "Information from Partners."

25 And we'll pull that up on the screen for you.

## SATTERFIELD - CROSS / McCLOSKEY

1 Can you please read the highlighted language to the jury.  
2 And it will be highlighted in one moment. Thank you.

3 A. Okay. This is a section about information from partners,  
4 and it says (as read):

5 "Advertisers, app developers, and publishers can  
6 send us information through Facebook business tools  
7 they use, including our social plug-ins, such as the  
8 Like button" --

9 I'm sorry. I think I was supposed to stop reading there.

10 Q. Go ahead.

11 A. (as read):

12 "Our social plug-ins, such as the Like button,  
13 Facebook log-in, our AFIs and SDK, or the Facebook  
14 pixel."

15 Q. Thank you. Can you keep reading one more sentence after  
16 that.

17 A. Yes (as read):

18 "These partners provide information about your  
19 activities off Facebook, including information about  
20 your device, websites you visit, purchases you make,  
21 the ads you see, and how you use their services,  
22 whether or not you have a Facebook account or are  
23 logged into Facebook"

24 Q. And then we'll highlight one more sentence there. If you  
25 wouldn't mind reading that as well.

1     **A.**     (as read):

2             "We also receive information about your online  
3             and offline actions and purchases from third-party  
4             data providers who have the rights to provide us with  
5             your information."

6     **Q.**     And one more sentence, please.

7             **THE COURT:** Just read the whole thing.

8     **BY MS. McCLOSKEY:**

9     **Q.**     Okay. Just read the whole thing.

10            **THE COURT:** Just read the whole thing and let's get on  
11            with it.

12            How much longer do you have?

13            **MS. McCLOSKEY:** I have a little bit longer, Your  
14            Honor.

15            **THE COURT:** Give me a number.

16            **MS. McCLOSKEY:** I maybe have another 30 minutes.

17            **THE COURT:** All right. We're going to be done after  
18            this. We tried to finish. We won't be able to do it, but  
19            we're going to end after this reading, please.

20            Go ahead.

21            **THE WITNESS:** (as read):

22            "Partners receive your data when you visit or  
23            use their services or through third parties they work  
24            with. We require each of these partners to have  
25            lawful rights to collect, use, and share your data

## PROCEEDINGS

1 before providing any data to us. Learn more about  
2 the types of partners we receive data from."

3 **THE COURT:** Okay. We're going to break now for three  
4 court days. Come back on Wednesday, 9:00 a.m.

5 It is my expectation that you will begin deliberating at  
6 the end of next week.

7 Now, whether that's Thursday or Friday is not clear to me  
8 yet, not clear to the parties yet, but plan -- just plan  
9 Wednesday a normal trial day. Plan Thursday 9:00 to 5:00. It  
10 may not be, but plan on that. And then Friday 9:00 to 5:00 and  
11 each day after that until a verdict is reached.

12 Now, we do provide a complimentary government meal of  
13 lunch on trial days, jury days, deliberation days. Okay? You  
14 can bring supplements and -- it's up to you, but a lunch will  
15 be provided.

16 Now, it's the same admonition we always end with a little  
17 extra punch because you're going to be out for three court  
18 days, five days total.

19 Do anything and everything but think about this case, talk  
20 about this case, ruminate, reflect, research, investigate, dig  
21 around. Don't do anything related to anything you've been  
22 hearing about in court.

23 And I'll see you Wednesday morning at 9:00 a.m.

24 **THE COURTROOM DEPUTY:** All rise.

25 (The jury leaves the courtroom.)

## PROCEEDINGS

(Proceedings were heard out of the presence of the jury.)

**THE COURT:** Okay. See you Wednesday.

(Proceedings adjourned at 4:01 p.m.)

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**CERTIFICATE OF REPORTER**

I certify that the foregoing is a correct transcript  
from the record of proceedings in the above-entitled matter.

DATE: Friday, July 25, 2025

A handwritten signature in blue ink, reading "Ruth Levine Ekhaus", followed by a horizontal line.

---

Ruth Levine Ekhaus, RMR, RDR, FCRR, CCG, CSR No. 12219  
Official Reporter, U.S. District Court